

PHASE II INVESTIGATION REPORT  
ROYAL CARTING SERVICES  
EAST FISHKILL, DUTCHESS COUNTY  
NEW YORK  
NYSDEC ID NO. 3-14-011

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**INTRODUCTION**

Geraghty & Miller, Inc. was retained by Teahan & Constantino on November 19, 1990 to perform a Phase II Investigation of the Royal Carting Services facility in East Fishkill, New York. Teahan & Constantino represents the Watch Hill Holding Corporation, which owns the Royal Carting facility. The investigation was performed under an Order on Consent (No. W3-0381-89-11) signed by the New York State Department of Environmental Conservation (NYSDEC) and the Watch Hill Holding Corporation on October 25, 1990. The consent order was signed after the Watch Hill Holding Corporation agreed to perform the Phase II Investigation.

The objective of the Phase II Investigation was to identify and characterize any environmental impacts associated with the Royal Carting site. The study was performed from March through August 1992 in accordance with the procedures specified in the Phase II Investigation Work Plan (Geraghty & Miller, Inc. 1991a) and the Phase II Investigation Quality Assurance Project Plan (Geraghty & Miller, Inc. 1991b). This report presents a summary of the work performed and the findings of the investigation.

**BACKGROUND**

**SITE DESCRIPTION**

The Royal Carting site is located near the intersection of Route 82 and Inky Road, in a rural area of Hopewell Junction, New York (see Figure 1). Hopewell Junction is located within the Town of East Fishkill in southwestern Dutchess County. Topographically, the area is characterized by rolling hills, with open fields and patches of young forest. The

approximately 5-acre site slopes to the north-northwest and is surrounded by swamp, trees, and dense vegetation.

The current configuration of the site is shown on Figure 2. A truck yard, transfer compactor, cardboard baler, tire shredder, and workshop/office building are located within a fenced compound just north of Route 82. An open, gravel and dirt covered lot is situated northwest of this area and is connected to the compound by an unpaved road. The lot is currently used as a dumpster storage area.

## **SITE HISTORY**

The site history is based on information obtained from NYSDEC files. The Royal Carting property was originally the site of a privately owned disposal facility. Municipal and industrial waste was reportedly landfilled and/or burned in the dumpster storage area. In 1971, the property was purchased by Royal Carting Services Company and now operates as a New York State-licensed transfer station.

From 1950 to 1962, several hundred metal containers and other waste materials generated by the Texaco Research Center in Glenham, New York were accepted at the site and stored in the eastern portion of the dumpster storage area (see Figure 2). According to Texaco, waste transporter receipt forms indicate that the containers deposited at the site consisted of 5-gallon pails, 100-pound drums, and 55-gallon drums of grease. Other waste materials listed by the transporter were miscellaneous trash and debris, scrap materials, and empty junked drums from barium transfer operations (Hudson 1990).

On March 20, 1981, a site inspection was conducted by Texaco personnel. During this inspection, the following waste materials were observed: 5-gallon pails of grease samples and residues; 15-gallon drums containing grease and oil (grease in open head drums, oil in closed head drums); and 55-gallon drums containing small sample bottles/jars and unidentified solids. Photographs taken during the site inspection showed drums labeled

"crystalite", "Citgo Solvent 26", and "Slop Gunk"; however, the drums may not have contained these materials since Texaco often used solvent and slop drums to dispose of off-spec lube oils, greases, and residues. Furthermore, Texaco has no record of providing crystalite and Citgo Solvent 26 to the Royal Carting site for disposal. According to Texaco, the greases disposed of were made from tallow, alkalies (lithium, calcium, and sodium), and lubricating oils. Some greases contained additives, such as barium or lead (Hudson 1990).

Between 1979 and 1981, site inspections were performed by the NYSDEC (1979), the Dutchess County Health Department (DCHD) (1981), and the U.S. Environmental Protection Agency (USEPA) (1981a, 1981b). These inspections noted conditions similar to those described by Texaco. Approximately 300 drums and pails containing grease and other unidentified substances were observed. Some of the containers were open. Although concerns were raised by the DCHD over the potential of contaminated runoff from these containers entering tributaries of Sprout Creek, the NYSDEC and USEPA noted that no leachate was evident during their inspections.

In November 1981, representative samples of the drummed waste were collected by the DCHD. The samples, labeled as "polymer", "grease", and "solid", were analyzed for ignitability, corrosivity, reactivity, EP (extraction procedure) toxicity, herbicides, and pesticides (Dullaghan 1982). According to DCHD records, these samples characterized the waste as non-hazardous (DCHD 1982a). Following this testing, some of the drums and pails were disposed at the FICA and Harlem Valley Landfills (DCHD 1982b). The remainder were buried on-site in June 1982 (DCHD 1982c). Soon afterwards, in July 1982, the DCHD conducted another site inspection and requested that Royal Carting excavate the buried containers for off-site disposal (DCHD 1982b). Under the direction of the DCHD and NYSDEC, all buried drums and surrounding soil were excavated by Royal Carting in October 1982 and disposed at the FICA Landfill in Poughkeepsie, New York (NYSDEC 1982).

In July 1986, the NYSDEC collected surface-water and stream sediment samples from the Royal Carting site and, based on the sampling results, NYSDEC regional staff recommended that the site be delisted (NYSDEC 1986a, NANCO 1986). The NYSDEC also noted that the on-site potable water well used by Royal Carting had been tested twice each year and had shown no evidence of contamination (NYSDEC 1986b). However, because of continued DCHD concerns (DCHD 1986), the site was not delisted, and a Phase II Work Plan was subsequently prepared by the NYSDEC (1989a). The Watch Hill Holding Corporation then agreed to carry out the Phase II Investigation.

The consent order for the Phase II Investigation was signed by the NYSDEC and the Watch Hill Holding Corporation in October 1990, and Geraghty & Miller was subsequently retained by Teahan & Constantino to perform the investigation. However, after an April 1991 site inspection conducted by Geraghty & Miller and the NYSDEC, both parties agreed that several aspects of the original work plan were unnecessary or impractical, prompting Geraghty & Miller to issue a revised document in May 1991 (Geraghty & Miller, Inc. 1991c). Modifications to the original work plan included changes in the number and location of samples, and the elimination of the electromagnetic survey. The electromagnetic survey was deleted because of the abundance of metallic objects in the landfill area, which would interfere with the survey results. Other geophysical surveys were deemed inappropriate for the same reason.

After comments were received from the NYSDEC in October 1991 (Dana 1991), a second revision of the work plan was issued in November (Geraghty & Miller, Inc. 1991a). Final work plan approval was received from the NYSDEC in February 1992 (Bleiweiss 1992).

### **METHODOLOGY**

The Phase II field investigation consisted of the following tasks: (1) air monitoring, (2) soil sampling, (3) monitoring well installation, (4) staff gauge installation and surveying,

(5) surface-water sampling, (6) stream sediment sampling, (7) groundwater sampling, (8) sampling of metal container, (9) aquifer testing, and (10) data validation. A brief description of each task is provided below. All tasks were conducted based on the NYSDEC-approved work plan (Geraghty & Miller, Inc. 1991a).

## **AIR MONITORING**

An air monitoring survey was performed on March 20, 1992 to assess the impact of the Royal Carting site on ambient air quality. The survey involved measuring the volatile organic content of ambient air at the site using an HNU photoionization detector. Measurements were collected at approximate 100-ft intervals along the site perimeter.

## **SOIL SAMPLING**

From March 23 through 25, 1992, five soil borings were drilled at the locations shown on Figure 2. The locations of Borings B-1 through B-4 coincide with the locations of the four monitoring wells. The fifth soil boring, B-5, was drilled in the former drum storage area. Sampling procedures are described in detail in Appendix B of the NYSDEC-approved Phase II Investigation Work Plan (Geraghty & Miller, Inc. 1991a).

The borings were drilled by Parratt Wolff, Inc. of Syracuse, New York using the hollow-stem auger drilling method and a 2-ft by 2-inch split-spoon sampler. A detailed description of the drilling method and Parratt Wolff's drilling logs are provided in Appendix A. At the monitoring well locations (B-1 through B-4), split-spoon samples were collected continuously from land surface to approximately 10 feet below the water table. At boring location B-5, in the former drum storage area, soil samples were collected continuously from land surface to the water table.

Each split-spoon sample was lithologically characterized and recorded by a Geraghty & Miller hydrogeologist and then divided into two equal parts. One aliquot was placed in

a sample container for possible laboratory analysis, while the other was placed in a half-pint jar for field screening of volatile organic compounds (VOCs). The half-pint glass jar was covered with aluminum foil, sealed with a screw-on lid, and allowed to equilibrate for approximately 15 minutes. The foil was then pierced and the headspace above the sample screened with an HNU photoionization detector for the presence of VOC vapors. The HNU readings were recorded on the Geraghty & Miller sample/core logs presented in Appendix B.

As indicated on the logs, VOC vapors were not detected in any of the samples. Since there was also no visual evidence of contamination, a sample representative of the formation was selected for laboratory analysis. Analytical services were provided by IEA, Inc. of Monroe, Connecticut. Samples were analyzed for the Target Compound and Target Analyte Lists (TCL/TAL), which include the following parameters: VOCs, semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and inorganics (metals and cyanide). Analytical procedures conformed with the September 1989 NYSDEC Analytical Services Protocol (ASP).

Upon completion, Borings B-1 through B-4 were converted into monitoring wells (see discussion below), while Boring B-5 was grouted to land surface. One representative soil sample from the screened zone of each monitoring well (Borings B-1 through B-4 only) was submitted to Parratt Wolff, Inc. for grain size analysis (noncohesive soil) or Atterberg limits testing (cohesive soil). The results of these tests are presented in Appendix C. The grain size analysis data were used to calculate the approximate hydraulic conductivity of the screened zones using Hazen's approximation, where conductivity (K) equals the square of the effective grain size of the sediment. The effective grain size is the grain-size diameter at which 10 percent by weight of the soil particles are finer and 90 percent are coarser (Freeze and Cherry 1979). The Hazen approximation is only valid for sandy noncohesive formations and does not distinguish between horizontal and vertical hydraulic conductivity.

## MONITORING WELL INSTALLATION

From March 23 through 26, 1992, four monitoring wells (W-1 through W-4) were installed by Parratt Wolff, Inc. at the locations shown on Figure 2. Well installation was performed using the hollow-stem auger drilling method in accordance with the guidelines provided in the NYSDEC Draft "Division of Environmental Enforcement Drilling & Monitoring Well Installation Guidance Manual" (NYSDEC 1988). Design of the filter pack and well development procedures conformed with the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4015. The wells were constructed with 4-inch diameter PVC casing and 10-ft sections of 4-inch diameter, machine-slotted, Schedule 40 PVC screen. A gravel pack of No. 1 Morie sand was installed in the well annulus to a depth of approximately 1 ft above the top of the screen. The gravel pack was topped with 1 ft of bentonite slurry, followed by a 1 ft layer of bentonite pellets, to seal off the screen zone. After the pellets were given approximately 1 hour to hydrate, the remainder of the annulus, from the top of the bentonite seal to ground surface, was grouted with a slurry of 5 percent bentonite and 95 percent Portland cement. The wells were completed by installing a protective steel casing and locking cap at ground surface to protect the well head. Well construction logs are presented in Appendix D, and construction details are summarized in Table 1.

Well development involved surging each well with a 3-inch diameter bailer, followed by evacuation with a centrifugal pump. Development continued until the well produced clear, sediment-free water with a turbidity below 50 Nephelometric Turbidity Units (NTUs), as indicated by a nephelometer. Development information, including the water level before and after development, was recorded on the well construction logs presented in Appendix D.

## STAFF GAUGE INSTALLATION AND SURVEYING

On April 1, 1992, staff gauges were installed at the six surface-water stations shown on Figure 2. During June 1992, the gauge locations and the elevation of the reference point on each gauge were surveyed by Mr. Peter R. Hustis, a licensed land surveyor in the State of New York. The locations, measuring-point elevations, and ground-surface elevations of the monitoring wells were also determined at this time.

## SURFACE-WATER SAMPLING

Surface-water samples were collected on April 1, 1992 at the three locations shown on Figure 2. Samples were collected by submerging a clean, polypropylene beaker in the stream and decanting water into the sample bottles. Sampling progressed from the furthest downstream location (SW-1) to the furthest upstream location (SW-3) to avoid possible cross-contamination between samples caused by disturbing stream sediments. A more detailed description of the sampling procedures is provided in Appendix C of the NYSDEC-approved Phase II Investigation Work Plan (Geraghty & Miller, Inc. 1991a).

The samples were analyzed by IEA, Inc. for modified TCL/TAL parameters (see discussion below), chemical oxygen demand (COD), total dissolved solids (TDS), and total suspended solids (TSS). Temperature, pH, and specific conductance were measured by Geraghty & Miller in the field and recorded on water sampling logs, which are included in Appendix E.

The TCL/TAL modification concerned the VOC analyses, which were performed using United States Environmental Protection Agency (USEPA) Method 524.2 instead of the standard Contract Laboratory Program (CLP) methodology specified in the NYSDEC ASP. The benefits of Method 524.2 are a larger analyte list and lower detection limits than the CLP method. Because of its greater sensitivity, Method 524.2 is commonly reserved for

testing drinking water supplies; however, at the request of the NYSDEC, it was used in this investigation to provide a more thorough evaluation of on-site water quality.

## **STREAM SEDIMENT SAMPLING**

Stream-sediment samples were collected on April 1, 1992 at the three locations shown on Figure 2. Samples were collected by hand from the top 6 inches of the stream bed (the stainless-steel clamshell dredge specified in the work plan could not be used because of the rocky stream bottom). Sampling progressed from the furthest downstream location to the furthest upstream location (SS-1 to SS-3) to prevent possible cross-contamination between samples caused by disturbing stream sediments. A more detailed description of the sampling procedures is provided in Appendix B of the Phase II Investigation Work Plan (Geraghty & Miller, Inc. 1991a). Samples were analyzed by IEA, Inc. for TCL/TAL parameters and total organic carbon (TOC).

## **GROUNDWATER SAMPLING**

Groundwater samples were collected from the four new monitoring wells on April 2, 1992. Prior to sampling, a synoptic round of water-level measurements was collected from all wells and staff gauges (see Table 2). Wells were evacuated with a centrifugal pump and sampled with a Teflon bailer. A complete description of the sampling procedures is provided in Appendix C of the NYSDEC-approved Phase II Investigation Work Plan (Geraghty & Miller, Inc. 1991a).

Samples were analyzed by IEA for modified TCL/TAL parameters, COD, TDS, and TSS. As in the surface-water sampling, the TCL/TAL modification involved using USEPA Method 524.2 instead of the standard CLP methodology for VOC analysis. Measurements of temperature, pH, and specific conductance were recorded by Geraghty & Miller in the field on the water sampling logs presented in Appendix E.

## **SAMPLING OF METAL CONTAINER**

During the soil sampling and well installation program, a partially buried metal container was discovered in the southeastern portion of the dumpster storage area. Further probing determined that it contained an oily black substance, resembling petroleum grease. At the request of the NYSDEC, a sample of this substance was collected on March 25, 1990 and analyzed for SVOCs, PCBs, and total petroleum hydrocarbons (TPH).

## **AQUIFER TESTING**

Aquifer testing was performed on May 6 and May 7, 1992 to estimate the permeability (hydraulic conductivity) of aquifer sediments. Slug tests were performed on all four monitoring wells and a constant-rate pumping test was performed on Well W-2. Data from these tests were compared to hydraulic conductivity values calculated from the grain size analysis data to check for consistency. This comparison is presented in a later section.

The slug tests were performed by removing a filled bailer from the well and monitoring the subsequent rise in water level. The pumping test was performed by pumping the well for 100 minutes (one logarithmic time cycle) at a constant rate of 18 gpm and monitoring the resultant drop in water level. In both cases, water-level changes were monitored continuously using a pressure transducer and data logger supplied by In-Situ Inc.

Hydraulic conductivity was determined from the water-level data using Geraghty & Miller's aquifer test analysis software, AQTESOLV. The Cooper-Jacob (1946), Theis (1935), and Neuman (1975) methods were used to analyze the pumping test data, while the Bouwer-Rice (1976) method was used for the slug tests.

## DATA VALIDATION

Analytical results from IEA were validated by Geraghty & Miller according to NYSDEC ASP requirements using the guidelines specified in "Laboratory Data Validation, Functional Guidelines for Evaluating Organics Analyses" (USEPA 1988a) and "Laboratory Data Validation, Functional Guidelines for Evaluating Inorganics Analyses" (USEPA 1988b). Validation of the data consisted of a systematic review of analytical results and quality control documentation for precision, accuracy, representativeness, completeness, and comparability. A more detailed discussion of the data validation process is provided in the NYSDEC-approved Phase II Investigation Quality Assurance Project Plan (Geraghty & Miller, Inc. 1991b).

## HYDROGEOLOGY

The Royal Carting site is located on a glacial outwash plain of sand and gravel, which is overlain by alluvial deposits of silt, sand, and peat in the swampy lowlands surrounding the former landfill. None of the borings drilled during the field investigation fully penetrated the unconsolidated deposits; however, the United States Geological Survey (USGS) estimates that the deposits are less than 40 ft thick in the vicinity of the Royal Carting site (USGS 1982). The outwash and alluvial sediments are underlain by the Stockbridge Group, a collection of undifferentiated carbonate rocks. A small mound of rock was observed in the former drum storage area in the northeastern portion of the site; however, the data collected during the field investigation were insufficient to determine whether this mound is an outcrop of the Stockbridge Group or glacial rubble. If the mound is in fact a bedrock outcrop, then the unconsolidated sediments may be thinner than indicated in the USGS report.

The water-level data collected on April 2, 1992 are summarized in Table 2 and are contoured on Figure 3. As indicated on the contour map, groundwater flows to the west-southwest under a fairly uniform gradient of approximately 0.004 ft/ft. The slight

groundwater mound evident in the western portion of the dumpster storage area indicates that groundwater flow in this area is affected by the adjacent swamp. Based on slightly higher groundwater elevations than surface-water elevations near this swamp, groundwater from the former landfill area is discharging to the swamp.

Streams just north and south of the dumpster storage area flow in a westerly direction, roughly parallel to groundwater flow, and are connected by a brook along the western property boundary, which flows to the south (see Figure 2). The streams are tributaries of Sprout Creek, which is situated approximately 150 ft west of the site, and overall surface-water flow is in this direction.

## **RESULTS**

### **AIR QUALITY**

Air quality results are summarized in Table 3. VOC vapor concentrations were at background levels (0 to 5 parts per million [ppm]) at all monitoring stations. Since the work plan (Geraghty & Miller, Inc. 1991a) required an air sampling program only if readings exceeded 10 ppm for 1 minute or more continuously, no further testing was performed.

### **SOIL QUALITY**

Analytical results for soil are presented in Tables 4 through 7. VOCs were detected in four of the five samples collected, at total concentrations ranging from 0.4 to 230 micrograms per kilogram (ug/kg) (see Table 4). Sample B-5, collected in the former drum storage area, exhibited the highest concentration of VOCs (230 ug/kg), with the principal compounds being acetone (180 ug/L) and 2-butanone (37 ug/L). Since these compounds are commonly used as paint, varnish, or lacquer solvents, and as additives in sealants, cements, and adhesives (Montgomery and Welkom 1990), they may have been derived from current operations in the former landfill area (i.e., dumpster storage/refurbishing).

However, acetone and 2-butanone are also common laboratory contaminants, and their absence from other soil samples collected from the former landfill area (B-2 and B-3) suggests that the concentrations exhibited by Sample B-5 may be a laboratory artifact. Regardless of source, the levels detected are below the current recommended soil cleanup objectives established by the NYSDEC (1992).

SVOCs were detected in all five samples collected (see Table 5). Samples B-1 through B-4 exhibited trace concentrations (2 to 15 ug/kg), while Sample B-5 exhibited a higher level of SVOCs (127 ug/kg). The only compounds detected were benzoic acid, diethylphthalate, fluoranthene, and butylbenzylphthalate. None of the samples contained pesticides or PCBs (see Table 6).

Of the SVOCs detected, benzoic acid, diethylphthalate, and butylbenzylphthalate are plasticizers, while fluoranthene is a polynuclear aromatic hydrocarbon (PAH). Plasticizers appear frequently in environmental samples due to the prevalence of plastics in manufactured products, including those used for sample collection and analysis. PAHs are characteristic of coal tar distillates, such as those found in road tar and creosote. The higher levels of these compounds exhibited by Sample B-5 may reflect previous operations in the former drum storage area. However, regardless of source, the concentrations detected are below current NYSDEC soil cleanup objectives (NYSDEC 1992).

Analytical results for inorganics are summarized in Table 7. Cyanide was not detected in any of the samples collected. Metals data for the downgradient borings (B-2 through B-5) were generally consistent with the background data from Boring B-1, and conformed with the range of concentrations reported by Shacklette and Boerngen (1984) and the NYSDEC (1992) for soils in the eastern United States (see Table 8).

## SURFACE-WATER QUALITY

Analytical results for surface-water samples are presented in Tables 9 through 13. VOCs were detected in only one sample, SW-1, at a total concentration of 2.82 micrograms per liter (ug/L) (see Table 9). All of the compounds detected (cis-1,2-dichloroethene, benzene, trichloroethene, and chlorobenzene) were reported at levels below current New York State Ambient Water Quality Standards and Guidance Values (AWQS/GVs) (NYSDEC 1991b).

None of the samples contained pesticides or PCBs, and the only SVOC detected was bis(2-ethylhexyl)phthalate, which appeared in both up- and downstream samples at concentrations above the New York State aquatic life criteria of 0.6 ug/L (NYSDEC 1991b) (see Tables 10 and 11). Bis(2-ethylhexyl)phthalate is a plasticizer which appears frequently in environmental samples due to the use of plastics during sample collection and analysis. Since similar concentrations (0.9 to 3 ug/L) were detected both up- and downstream of the landfill, it is Geraghty & Miller's opinion that this compound is a laboratory artifact or background contaminant.

Inorganic results for the surface-water samples are presented in Table 12. Antimony, arsenic, cadmium, cobalt, mercury, nickel, potassium, selenium, silver, thallium, and cyanide were not detected in any of the samples, while beryllium, chromium, and vanadium were detected only once, in the unfiltered sample from Station SW-1. This sample also contained iron at a level above the New York State AWQS/GV of 300 ug/L, and aluminum, lead, and zinc at concentrations above their respective aquatic life criteria (NYSDEC 1991b). The higher metallic content of stream water at Station SW-1 may be related to metallic debris in the landfill or to the storage of metal dumpsters in the former landfill area.

Leachate indicator results are presented in Table 13. COD and TSS were below detection limits in all three samples, while TDS concentrations were similar at both up- and

downstream sampling locations. In the opinion of Geraghty & Miller, these results do not indicate an impact from the landfill.

## STREAM SEDIMENT QUALITY

Analytical results for stream sediment are presented in Tables 14 through 18. VOCs were detected in two samples: SS-1, which is located downstream of the landfill and SS-3, which is located upstream (see Figure 2). Sample SS-1 contained 40 ug/kg of trichloroethene and 21 ug/kg of 1,2-dichloroethene, a trichloroethene breakdown product. Sample SS-3 contained 37 ug/kg of acetone.

As discussed previously, acetone is used as a paint, varnish, or lacquer solvent, and as an additive in sealants and adhesives. Currently, the most common application of trichloroethene is as an engine parts degreaser; however, it was also frequently used in the past as a septic tank cleaner. Both compounds appear in a variety of household and industrial products and are common environmental contaminants. Therefore, the appearance of residual levels in stream sediment downstream of the landfill would not be unexpected. However, because similar VOC concentrations were detected in both up- and downstream samples, it is Geraghty & Miller's opinion that there may be background contamination from upstream sources.

SVOCs were also detected in both up- and downstream sediment samples, with total concentrations ranging from 48 to 316 ug/L (see Table 15). The only compounds detected were 1,2-dichlorobenzene, di-n-butylphthalate, fluoranthene, pyrene, and chrysene. Di-n-butylphthalate is a plasticizer, while 1,2-dichlorobenzene is used as a solvent and as an additive in insecticides and fumigants. Fluoranthene, pyrene, and chrysene are PAHs, which, as discussed previously, are characteristic of coal tar distillates, such as those found in road tar and creosote. Again, these are common environmental contaminants and may or may not be related to the former landfill. Because SVOCs were detected both up- and

downstream of the site, it is Geraghty & Miller's opinion that there may be some contribution from upstream sources.

Only one pesticide (4,4'-DDE) was detected in stream sediment (see Table 16). This compound was reported in Samples SS-1 and SS-2 at estimated concentrations of 4.2 and 10 ug/kg, respectively. None of the samples contained PCBs.

TOC data for stream sediment are summarized in Table 17. Downstream samples SS-1 and SS-2 both contained greater than 8 percent organic carbon by weight, which exceeded the calibration range of the analytical procedure. In comparison, the upstream sample, SS-3, contained less than 1 percent TOC. The higher TOC content of the downstream sediment samples likely reflects the swampy conditions in the area where these samples were collected (i.e., an abundance of peat and decaying vegetation).

TOC is a general indicator of the adsorptive capacity of soil or sediment (that is, the more organic carbon present, the more likely that an organic compound will be bound up in the soil matrix). With this in mind, the NYSDEC has calculated sediment criteria for non-polar organic compounds that are normalized to organic carbon content (NYSDEC 1989b). Following NYSDEC guidance (1989b), sediment criteria for the Royal Carting site were determined by multiplying the normalized criteria in micrograms per gram of organic carbon (ug/gOC) by the fraction of organic carbon present in each sample (80 grams of organic carbon per kilogram of sediment [gOC/kg] for samples SS-1 and SS-2, and 10 gOC/kg for sample SS-3). The only compound detected above these criteria was 4,4'-DDE, which was reported at a concentration of 10 ug/L in Sample SS-2, exceeding the calculated criteria of 8 ug/L.

Inorganic data for stream sediment are presented in Table 18. Antimony, cadmium, mercury, silver, thallium, and cyanide were not detected in any of the samples. Aluminum, barium, calcium, chromium, lead, and sodium concentrations were higher in Sample SS-1 than in the other samples; however, concentrations were below sediment criteria established

by the NYSDEC (1989b) and within the range reported by Shacklette and Boerngen (1984) for soils in the eastern United States (see Table 8).

## GROUNDWATER QUALITY

Analytical results for groundwater are presented in Tables 19 through 23. With the exception of Well W-2, VOC levels were uniformly low, with total concentrations ranging from 0.2 ug/L to 1.03 ug/L (see Table 19). Well W-2 exhibited a total VOC concentration of 206 ug/L (223.9 ug/L replicate), with the main constituents being dichlorodifluoromethane and bromomethane. Both of these compounds were detected at concentrations above the New York State principal organic contaminant (POC) groundwater standard of 5 ug/L (NYSDEC 1991b). No other compounds were detected above New York State AWQS/GVs.

Dichlorodifluoromethane and bromomethane are both refrigerants and their appearance in Well W-2 may be related to household debris, such as air conditioners or refrigerators, disposed in the landfill. However, dichlorodifluoromethane was also detected in the field and trip blanks submitted with the groundwater samples, suggesting that this contamination may have been introduced during sample storage or analysis.

None of the samples contained pesticides or PCBs, and the only SVOCs detected were bis(2-ethylhexyl)phthalate (0.8 to 5 ug/L) and di-n-octylphthalate (1 ug/L). As discussed previously, phthalates are plasticizers, which appear frequently in environmental samples and can be related to the use of plastic tubing and containers during sample collection and analysis. At the levels detected, it is Geraghty & Miller's opinion that this contamination is a laboratory artifact. However, regardless of source, the concentrations are below New York State AWQS/GVs.

Inorganic results for groundwater are presented in Table 22. Antimony, cadmium, cobalt, mercury, selenium, silver, and cyanide were not detected in any of the samples, and

only trace concentrations of arsenic, beryllium, chromium, copper, lead, nickel, thallium, and vanadium were reported. Of the remaining metals, iron, manganese, and sodium were detected at concentrations above New York State AWQS/GVs in downgradient monitoring wells. Iron and sodium also exceeded New York State AWQS/GVs in the upgradient monitoring well (MW-1), suggesting that groundwater locally contains high ambient levels of these elements.

Analytical data for leachate indicator parameters are provided in Table 23. TDS was highest in the background well MW-1 (679 mg/L), while COD and TSS were highest in Well W-2 (20.7 mg/L and 353 mg/L, respectively).

## CONTENTS OF METAL CONTAINER

Analytical results for the sample collected from the metal container are presented in Table 24. The sample contained approximately 43 percent (428,000 mg/kg) petroleum hydrocarbons by weight and less than 1 percent (1,426 mg/kg) SVOCs. PCBs were not detected. The chemical profile of the substance most closely resembles petroleum oil or grease, similar to the non-hazardous materials previously disposed at the site by Texaco.

## AQUIFER CHARACTERISTICS

Hydraulic conductivity values calculated from the sieve analysis and slug test data are summarized in Table 25. The grain-size distribution and displacement plots used in the calculations are presented in Appendices F and G, respectively. Hydraulic conductivity values for the slug tests ranged from 6.16 to 70.1 ft per day (ft/day), with an average value of 41.8 ft/day. In comparison, the sieve analyses yielded an average hydraulic conductivity of 15.9 ft/day (see Table 25). The sieve analysis results may be lower because the Hazen approximation does not account for differences between the horizontal and vertical hydraulic conductivity of the aquifer. Regardless, the data are in general agreement and

are characteristic of an aquifer consisting mainly of silt and fine-to-medium sand (Todd 1980).

Drawdown plots for the pumping test data are presented in Appendix G. The data were analyzed using the Cooper-Jacob (1946), Theis (1935), and Neuman (1975) methods; however, the analytical solutions for these methods were determined to be invalid because of the boundary effect created by the nearby stream. Therefore, transmissivity values for the pumping test are not provided.

Groundwater velocity for the site was determined by multiplying the measured hydraulic gradient (0.004 ft/ft) by the average hydraulic conductivity determined from the sieve analyses and slug tests (28.9 ft/day), and then dividing by an assumed porosity of 0.25. This calculation resulted in a groundwater velocity of 0.46 ft/day, or 167 ft/year.

### **FINDINGS AND CONCLUSIONS**

The Phase II Investigation conducted by Geraghty & Miller provided a comprehensive overview of environmental conditions at the Royal Carting facility. All media potentially impacted by the landfill (air, soil, surface water, stream sediment, and groundwater) were evaluated, with the following results:

1. No impacts on ambient air quality were detected.
2. PCBs were not detected in any of the soil, surface-water, stream sediment, groundwater, or waste samples collected during the investigation.
3. Soil impacts detected at the site were limited to low levels of VOCs and SVOCs in the landfill soil. The levels detected are below current New York State soil clean-up objectives.

4. VOCs were detected in surface-water downstream from the landfill at one sampling location (SW-1). The levels detected are below New York State AWQS/GVs.
5. Metals were detected in surface-water downstream from the landfill at concentrations above background levels. Iron was detected above the New York State AWQS/GV of 300 ug/L at Stations SW-1 and SW-2, while aluminum, lead, and zinc were detected above New York State aquatic life criteria at Station SW-1. Concentrations of these metals should decrease naturally with time and distance downstream.
6. Stream sediment downstream from the landfill exhibited slightly elevated concentrations of metals at one sampling location (SS-1); however, the levels detected are below New York State sediment criteria and are within the range of concentrations reported for the eastern United States.
7. Low levels of VOCs, SVOCs, and the pesticide 4,4'-DDE were detected in stream sediment downstream from the landfill. VOC and SVOC concentrations were below New York State sediment criteria, while 4,4'-DDE was detected slightly above the New York State criterion at one sampling location (SS-2). VOCs and SVOCs were also detected upstream from the landfill, suggesting that there may be background contamination from upstream sources. Regardless of source, high levels of organic carbon in sediment downstream from the landfill should render any organic contaminants present relatively immobile.
8. VOCs were detected above New York State AWQS/GVs in only one downgradient monitoring well (W-2). Samples collected from this well contained dichlorodifluoromethane and bromomethane above the POC groundwater standard of 5 ug/L. In Geraghty & Miller's opinion, this contamination may be a laboratory artifact. Regardless, dichlorodifluoromethane and bromomethane were not detected in downgradient surface-water samples; therefore, any contamination present is highly localized.

9. Iron, manganese, and sodium were detected at levels above New York State AWQS/GVs in groundwater downgradient from the landfill; however, iron and sodium also exceeded New York State AWQS/GVs in the upgradient monitoring well, indicating that there are high ambient concentrations of these metals in groundwater.
10. The chemical profile of the contents of the metal container is consistent with that of petroleum oil or grease, similar to the non-hazardous materials previously stored at the site by Texaco. In Geraghty & Miller's opinion, this container is likely a Texaco pail or drum that was overlooked during the 1982 drum removal operation.
11. The calculated groundwater velocity for the site is 167 ft/yr. At this rate, it would take approximately 3 years for groundwater to travel from the former drum storage area to the furthest downgradient monitoring well (W-3). Therefore, since the Texaco drums were removed in 1982, any impacts from residual waste associated with drum storage activities should already be evident in downgradient monitoring wells.

Based on these results, it is Geraghty & Miller's opinion that the environmental impact of the Royal Carting site is minimal and that the site does not pose a significant threat to public health or the environment.

### **RECOMMENDATIONS**

Since the results of the Phase II Investigation and previous sampling performed by the NYSDEC have demonstrated that there are no significant environmental impacts associated with the Royal Carting site, Geraghty & Miller recommends that no further investigative work be performed and that the NYSDEC be petitioned for delisting.

Table 1. Monitoring Well Construction Details, Royal Carting Services, East Fishkill, New York.

Well Number	Material	Diameter (inches)	Total Depth (feet below measuring point)	Screened Interval (feet below measuring point)	Measuring Point Elevation (feet above mean sea level)
W-1	PVC	4	24.86	14.86 - 24.86	240.72
W-2	PVC	4	15.74	5.74 - 15.74	229.97
W-3	PVC	4	15.74	5.74 - 15.74	226.72
W-4	PVC	4	27.81	17.81 - 27.81	242.41

Table 2. Water-Level Measurements Collected on April 2, 1992, Royal Carting Services, East Fishkill, New York.

Well/ Staff Gauge Number	Measuring Point Elevation (feet above mean sea level)	Depth to Water (feet below measuring point)	Water-Level Elevation (feet above mean sea level)
W-1	240.72	14.21	226.51
W-2	229.97	6.43	223.54
W-3	226.72	4.16	222.56
W-4	242.41	18.58	223.83
SG-1	223.86	1.70	222.16
SG-2	226.01	2.50	223.51
SG-3	226.79	0.50	226.29
SG-4	226.26	0.75	225.51
SG-5	225.32	1.50	223.82
SG-6	225.25	2.90	222.35

W Well.  
SG Staff gauge.

Table 3. Volatile Organic Vapors Detected in Ambient Air, Royal Carting Services, East Fishkill, New York.

Station Number	HNU Reading (ppm)
GM-A1	0.2
GM-A2	0.2
GM-A3	0.2
GM-A4	0.2
GM-A5	0.2
GM-A6	0.2
GM-A7	0.2
GM-A8	0.2
GM-A9	0.2
GM-A10	0.2
GM-A11	0.2
GM-A12	0.2
GM-A13	0.2
GM-A14	0.2
GM-A15	0.3
GM-A16	0.3
GM-A17	0.4
GM-A18	0.3
GM-A19	0.3
GM-A20	0.2
GM-A21	0.3
GM-A22	0.3
GM-A23	0.3

Measurements taken with HNU photoionization detector calibrated to 100 parts per million isobutylene.

ppm Parts per million.

Table 4. Volatile Organic Compounds Detected in Soil, Royal Carting Services, East Fishkill, New York.

Parameters (concentrations in ug/kg)	Sample Identification:				
	B-1	B-2	B-3	B-4	B-5
	Sample Depth: 14-16 feet Sample Date: 3/24/92	4-6 feet 3/24/92	2-4 feet 3/24/92	18-20 feet 3/25/92	6-8 feet 3/25/92
Chloromethane	<12	<17	<15	<13	<21
Bromomethane	<12	<17	<15	<13	<21
Vinyl chloride	<12	<17	<15	<13	<21
Chloroethane	<12	<17	<15	<13	<21
Methylene chloride	<6	<9	<8	<6	<11
Acetone	<12	<17	<20	<15	180
Carbon disulfide	<6	4 J	<8	<6	<11
1,1-Dichloroethene	<6	2 J	<8	<6	<11
1,1-Dichloroethane	<6	<9	<8	<6	<11
1,2-Dichloroethene (total)	<6	2 J	<8	<6	2 J
Chloroform	<6	<9	<8	<6	<11
1,2-Dichloroethane	<6	<9	<8	<6	<11
2-Butanone	<12	<17	<15	<13	37
1,1,1-Trichloroethane	<6	<9	<8	<6	<11
Carbon tetrachloride	<6	4 J	<8	<6	<11
Vinyl acetate	<12	<17	<15	<13	<21
Bromodichloromethane	<6	<9	<8	<6	<11
1,2-Dichloropropane	<6	<9	<8	<6	<11
cis-1,3-Dichloropropene	<6	<9	<8	<6	<11
Trichloroethene	<6	3 J	<8	<6	<11
Dibromochloromethane	<6	<9	<8	<6	<11
1,1,2-Trichloroethane	<6	<9	<8	<6	<11
Benzene	<6	2 J	<8	<6	3 J
trans-1,3-Dichloropropene	<6	<9	<8	<6	<11
Bromoform	<6	<9	<8	<6	<11
4-Methyl-2-pentanone	<12	<17	<15	<13	<21
2-Hexanone	<12	<17	<15	<13	<21
Tetrachloroethene	<6	<9	<8	<6	<11
1,1,2,2-Tetrachloroethane	<6	<9	<8	<6	<11
Toluene	<6	12	2 J	0.4 J	2 J
Chlorobenzene	<6	9	<8	<6	2 J
Ethylbenzene	<6	<9	<8	<6	<11
Styrene	<6	<9	<8	<6	<11
Xylene (total)	<6	<9	<8	<6	4 J
Total VOCs:	ND	38	2	0.4	230

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/kg Micrograms per kilogram.  
J Estimated value.  
VOCs Volatile organic compounds.  
ND Not detected.

Table 4. Volatile Organic Compounds Detected in Soil, Royal Carting Services, East Fishkill, New York.

Parameters (concentrations in ug/L)	Sample Identification: Field Blank 1	Trip Blank 1	Trip Blank 2
	Sample Date: 3/25/92	3/24/92	3/24/92
Chloromethane	<10	<10	<10
Bromomethane	<10	<10	<10
Vinyl chloride	<10	<10	<10
Chloroethane	<10	<10	<10
Methylene chloride	<5	4 J	<8
Acetone	<10	<10	<10
Carbon disulfide	<5	<5	0.7 J
1,1-Dichloroethene	<5	<5	<5
1,1-Dichloroethane	<5	<5	<5
1,2-Dichloroethene (total)	<5	<5	<5
Chloroform	<5	<5	<5
1,2-Dichloroethane	<5	<5	<5
2-Butanone	R	R	R
1,1,1-Trichloroethane	<5	<5	<5
Carbon tetrachloride	<5	<5	<5
Vinyl acetate	<10	<10	<10
Bromodichloromethane	<5	<5	<5
1,2-Dichloropropane	<5	<5	<5
cis-1,3-Dichloropropene	<5	<5	<5
Trichloroethene	<5	<5	<5
Dibromochloromethane	<5	<5	<5
1,1,2-Trichloroethane	<5	<5	<5
Benzene	<5	<5	<5
trans-1,3-Dichloropropene	<5	<5	<5
Bromoform	<5	<5	<5
4-Methyl-2-pentanone	<10	<10	<10
2-Hexanone	<10	<10	2 J
Tetrachloroethene	<5	<5	<5
1,1,2,2-Tetrachloroethane	<5	<5	1 J
Toluene	<5	<5	<5
Chlorobenzene	<5	<5	<5
Ethylbenzene	<5	<5	<5
Styrene	<5	<5	<5
Xylene (total)	<5	<5	<5
Total VOCs:	ND	4	3.7

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
J          Estimated value.  
VOCs      Volatile organic compounds.  
ND        Not detected.

Table 5. Semivolatile Organic Compounds Detected in Soil, Royal Carting Services, East Fishkill, New York.

Sample Identification:	B-1	B-2	B-3	B-4	B-5
Sample Depth:	14-16 feet	4-6 feet	2-4 feet	18-20 feet	6-8 feet
Sample Date:	3/24/92	3/24/92	3/24/92	3/25/92	3/25/92
Parameters (concentrations in ug/kg)					
Phenol	<410	<400	<450	<390	<600
bis(2-Chloroethyl)ether	<410	<400	<450	<390	<600
2-Chlorophenol	<410	<400	<450	<390	<600
1,3-Dichlorobenzene	<410	<400	<450	<390	<600
1,4-Dichlorobenzene	<410	<400	<450	<390	<600
Benzyl alcohol	<410	<400	<450	<390	<600
1,2-Dichlorobenzene	<410	<400	<450	<390	<600
2-Methylphenol	<410	<400	<450	<390	<600
bis(2-Chloroisopropyl)ether	<410	<400	<450	<390	<600
4-Methylphenol	<410	<400	<450	<390	<600
N-Nitroso-di-n-propylamine	<410	<400	<450	<390	<600
Hexachloroethane	<410	<400	<450	<390	<600
Nitrobenzene	<410	<400	<450	<390	<600
Isophorone	<410	<400	<450	<390	<600
2-Nitrophenol	<410	<400	<450	<390	<600
2,4-Dimethylphenol	<410	<400	<450	<390	<600
Benzoic acid	2 J	7 J	7 J	<1900	91 J
bis(2-Chloroethoxy)methane	<410	<400	<450	<390	<600
2,4-Dichlorophenol	<410	<400	<450	<390	<600
1,2,4-Trichlorobenzene	<410	<400	<450	<390	<600
Naphthalene	<410	<400	<450	<390	<600
4-Chloroaniline	<410	<400	<450	<390	<600
Hexachlorobutadiene	<410	<400	<450	<390	<600
4-Chloro-3-methylphenol	<410	<400	<450	<390	<600
2-Methylnaphthalate	<410	<400	<450	<390	<600
Hexachlorocyclopentadiene	<410	<400	<450	<390	<600
2,4,6-Trichlorophenol	<410	<400	<450	<390	<600
2,4,5-Trichlorophenol	<2000	<2000	<2200	<1900	<2900
2-Chloronaphthalene	<410	<400	<450	<390	<600
2-Nitroaniline	<2000	<2000	<2200	<1900	<2900
Dimethylphthalate	<410	<400	<450	<390	<600
Acenaphthylene	<410	<400	<450	<390	<600
2,6-Dinitrotoluene	<410	<400	<450	<390	<600
3-Nitroaniline	<2000	<2000	<2200	<1900	<2900
Acenaphthene	<410	<400	<450	<390	<600
2,4-Dinitrophenol	<2000	<2000	<2200	<1900	<2900
4-Nitrophenol	<2000	<2000	<2200	<1900	<2900
Dibenzofuran	<410	<400	<450	<390	<600
2,4-Dinitrotoluene	<410	<400	<450	<390	<600
Diethylphthalate	<410	8 J	<450	<390	15
4-Chlorophenyl-phenylether	<410	<400	<450	<390	<600
Fluorene	<410	<400	<450	<390	<600

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/kg      Micrograms per kilogram.  
J          Estimated value.

Table 5. Semivolatile Organic Compounds Detected in Soil, Royal Carting Services, East Fishkill, New York.

Sample Identification:					
Sample Depth:					
Sample Date:					
Parameters	B-1	B-2	B-3	B-4	B-5
(concentrations in ug/kg)	14-16 feet	4-6 feet	2-4 feet	18-20 feet	6-8 feet
	3/24/92	3/24/92	3/24/92	3/25/92	3/25/92
4-Nitroaniline	<2000	<2000	<2200	<1900	<2900
4,6-Dinitro-2-methylphenol	<2000	<2000	<2200	<1900	<2900
N-Nitrosodiphenylamine	<410	<400	<450	<390	<600
4-Bromophenyl-phenylether	<410	<400	<450	<390	<600
Hexachlorobenzene	<410	<400	<450	<390	<600
Pentachlorophenol	<2000	<2000	<2200	<1900	<2900
Phenanthrene	<410	<400	<450	<390	<600
Anthracene	<410	<400	<450	<390	<600
Di-n-butylphthalate	<410	<400	<450	<390	<600
Fluoranthene	<410	<400	<450	<390	21 J
Pyrene	<410	<400	<450	<390	<600
Butylbenzylphthalate	<410	<400	<450	5 J	<600
3,3'-Dichlorobenzidine	<820	<800	<890	<790	<1200
Benzo(a)anthracene	<410	<400	<450	<390	<600
Chrysene	<410	<400	<450	<390	<600
bis(2-Ethylhexyl)phthalate	<410	<400	<450	<390	<600
Di-n-octylphthalate	<410	<400	<450	<390	<600
Benzo(b)fluoranthene	<410	<400	<450	<390	<600
Benzo(k)fluoranthene	<410	<400	<450	<390	<600
Benzo(a)pyrene	<410	<400	<450	<390	<600
Indeno(1,2,3-cd)pyrene	<410	<400	<450	<390	<600
Dibenzo(a,h)anthracene	<410	<400	<450	<390	<600
Benzo(g,h,i)perylene	<410	<400	<450	<390	<600
Total SVOCs:	2	15	7	5	127

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/kg Micrograms per kilogram.

J Estimated value.

SVOCs Semivolatile organic compounds.

ND Not Detected.

Table 6. Pesticides/PCBs Detected in Soil, Royal Carting Services, East Fishkill, New York.

	Sample I.D.: Sample Depth: Sample Date:	B-1 14-16 feet 3/24/92	B-2 4-6 feet 3/24/92	B-3 2-4 feet 3/24/92	B-4 18-20 feet 3/25/92	B-5 6-8 feet 3/25/92
Parameters (concentrations in ug/kg)						
<u>Pesticides:</u>						
alpha-BHC		<10	<9.8	<11	<9.9	<15
beta-BHC		<10	<9.8	<11	<9.9	<15
delta-BHC		<10	<9.8	<11	<9.9	<15
gamma-BHC (Lindane)		<10	<9.8	<11	<9.9	<15
Heptachlor		<10	<9.8	<11	<9.9	<15
Aldrin		<10	<9.8	<11	<9.9	<15
Heptachlor epoxide		<10	<9.8	<11	<9.9	<15
Endosulfan I		<10	<9.8	<11	<9.9	<15
Dieldrin		<20	<20	<22	<20	<29
4,4'-DDE		<20	<20	<22	<20	<29
Endrin		<20	<20	<22	<20	<29
Endosulfan II		<20	<20	<22	<20	<29
4,4'-DDD		<20	<20	<22	<20	<29
Endosulfan sulfate		<20	<20	<22	<20	<29
4,4'-DDT		<20	<20	<22	<20	<29
Methoxychlor		<100	<98	<110	<99	<150
Endrin ketone		<20	<20	<22	<20	<29
alpha-Chlordane		<100	<98	<110	<99	<150
gamma-Chlordane		<100	<98	<110	<99	<150
Toxaphene		<200	<200	<220	<200	<290
<u>PCBs:</u>						
Aroclor-1016		<100	<98	<110	<99	<150
Aroclor-1221		<100	<98	<110	<99	<150
Aroclor-1232		<100	<98	<110	<99	<150
Aroclor-1242		<100	<98	<110	<99	<150
Aroclor-1248		<100	<98	<110	<99	<150
Aroclor-1254		<200	<200	<220	<200	<290
Aroclor-1260		<200	<200	<220	<200	<290

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/kg      Micrograms per kilogram.  
PCBs      Polychlorinated biphenyls.

Table 7. Inorganics Detected in Soil, Royal Carting Services, East Fishkill, New York.

	Sample I.D.:	B-1	B-2	B-3	B-4	B-5
	Sample Depth:	14-16 feet	4-6 feet	2-4 feet	18-20 feet	6-8 feet
	Sample Date:	3/24/92	3/24/92	3/24/92	3/25/92	3/25/92
Parameters (concentrations in mg/kg)						
Aluminum		11300	16400	23600	13300	20100
Antimony		<6.3	<6.2	<8.2	<6.0	<7.6
Arsenic		4.5	0.50 B	5.1	5.4	2.6 B
Barium		30.6 B	170	121	32.6 B	98.6
Beryllium		<0.23	0.32 B	0.48 B	0.26 B	0.39 B
Cadmium		<0.47	0.59 B	0.78 B	<0.44	0.66 B
Calcium		1270	1600	3410	864 B	3600
Chromium		13.6	16.4	24.2	15.6	24.4
Cobalt		9.6 B	7.8 B	12.1 B	10.7 B	10.9 B
Copper		31.1	22.6	38.1	34.1	30.2
Iron		24500	19200	30700	28400	26600
Lead		14.5 J	16.6 J	33.5 J	10.8 J	41.0 J
Magnesium		5630	5210	7040	6670	6070
Manganese		607	202	821	869	456
Mercury		<0.09 J	<0.11 J	<0.18 J	<0.10 J	<0.15 J
Nickel		21.5	19.0	28.4	25.0	24.6
Potassium		1240	1130 B	1510 B	1730	1440
Selenium		<0.46 J	<0.43 J	1.9 BJ	<0.44 J	1.3 BJ
Silver		<1.2	<1.1	<1.5	<1.1	<1.4
Sodium		185 B	81.9 B	125 B	52.4 B	132 B
Thallium		<0.23	<0.22	<0.33	<0.22	<0.28
Vanadium		13.2	13.3	25.9	15.2	21.4
Zinc		64.6	81.7	109	71.1	107
Cyanide		<3.1	<2.7	<3.8	<3.0	<3.4

Analyses performed by Industrial and Environmental Analysts, Inc.

mg/kg Milligrams per kilogram.

B Concentration is between the instrument detection limit and the contract required detection limit.

J Estimated value.

Table 8. Reported Concentrations of Inorganic Elements in Eastern United States Soils.

Element	<u>Shacklett and Boerngen (1984)</u>		<u>NYSDEC (1992)</u>
	Average (mg/kg)	Range (mg/kg)	Background (mg/kg)
Aluminum	33,000	700 - >100,000	33,000
Antimony	0.52	<1 - 8.8	NA
Arsenic	4.8	<0.1 - 73	3 - 12
Barium	290	10 - 1500	15 - 600
Beryllium	0.55	<1 - 7	0 - 1.75
Cadmium	NA	NA	0.1 - 1
Calcium	3,400	100 - 280,000	130 - 35,000
Chromium	33	1 - 1,000	1.5 - 40
Cobalt	5.9	<3 - 70	2.5 - 60
Copper	13	<1 - 700	1 - 50
Iron	14,000	100 - >100,000	2,000 - 550,000
Lead	14	<10 - 300	4 - 61
Magnesium	2,100	50 - 50,000	100 - 5,000
Manganese	260	<2 - 7,000	50 - 5,000
Mercury	0.081	<0.01 - 3.4	0.001 - 0.2
Nickel	11	<5 - 700	0.5 - 25
Potassium	12,000	50 - 37,000	8,500 - 43,000
Selenium	0.3	<0.1 - 3.9	0.1 - 3.9
Silver	NA	NA	NA
Sodium	2,500	<500 - 50,000	6,000 - 8,000
Thallium	NA	NA	NA
Vanadium	43	<7 - 300	1 - 300
Zinc	40	<5 - 2,900	9 - 50

mg/kg      Milligrams per kilogram.  
 NA        Not available.

nick#1/eastus.tab

Table 9. Volatile Organic Compounds Detected in Surface Water, Royal Carting Services, East Fishkill, New York.

Sample Identification: Sample Date:	SW-1 4/1/92	SW-2 4/1/92	SW-3 4/1/92
Parameter (concentrations in ug/L)			
Dichlorodifluoromethane	<1.0	<1.0	<1.0
Chloromethane	<1.0	<1.0	<1.0
Vinyl chloride	<1.0	<1.0	<1.0
Bromomethane	<1.0	<1.0	<1.0
Chloroethane	<1.0	<1.0	<1.0
Trichlorofluoromethane	<1.0	<1.0	<1.0
Methylene chloride	<1.0	<1.0	<1.0
1,1-Dichloroethene	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	<1.0	<1.0	<1.0
1,1-Dichloroethane	<1.0	<1.0	<1.0
2,2-Dichloropropane	<1.0 J	<1.0	<1.0 J
cis-1,2-Dichloroethene	1.9 J	<1.0	<1.0
Bromochloromethane	<1.0	<1.0	<1.0
Chloroform	<1.0	<1.1	<1.1
1,1,1-Trichloroethane	<1.0	<1.0	<1.0
1,1-Dichloropropene	<1.0	<1.0	<1.0
Carbon tetrachloride	<1.0	<1.0	<1.0
Benzene	0.02 J	<1.0	<1.0
1,2-Dichloroethane	<1.0	<1.0	<1.0
Trichloroethene	0.70 J	<1.0	<1.0
1,2-Dichloropropane	<1.0	<1.0	<1.0
Dibromomethane	<1.0	<1.0	<1.0
Bromodichloromethane	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	<1.0	<1.0	<1.0
Toluene	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	<1.0	R	<1.0
1,1,2-Trichloroethane	<1.0	<1.0	<1.0
Tetrachloroethene	<1.0	<1.0	<1.0
1,3-Dichloropropane	<1.0	<1.0	<1.0
Dibromochloromethane	<1.0	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0	<1.0
Chlorobenzene	0.20 J	<1.0	<1.0
1,1,1,2-Tetrachloroethane	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0
meta and/or para-Xylene	<1.0	<1.0	<1.0
ortho-Xylene	<1.0	<1.0	<1.0
Styrene	<1.0	<1.0	<1.0
Bromoform	R	R	R
Isopropylbenzene	<1.0	<1.0	<1.0
Bromobenzene	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	<1.0	<1.0	<1.0
Propylbenzene	<1.0	<1.0	<1.0

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
 J          Estimated value.  
 R          Unusable data.

Table 9. Volatile Organic Compounds Detected in Surface Water, Royal Carting Services, East Fishkill, New York.

Sample Identification: Sample Date:	SW-1 4/1/92	SW-2 4/1/92	SW-3 4/1/92
Parameter (concentrations in ug/L)			
2-Chlorotoluene	<1.0	<1.0	<1.0
4-Chlorotoluene	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	<1.0	<1.0	<1.0
tert-Butylbenzene	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	<1.0	<1.0	<1.0
sec-Butylbenzene	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	<1.0	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0	<1.0
Butylbenzene	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	<1.0	<1.0	<1.0
Hexachlorobutadiene	<1.0	<1.0	<1.0
Naphthalene	<1.0	<1.0	<1.0
1,2,3-Trichlorobenzene	<1.0	<1.0	<1.0
Total VOCs:	2.82	ND	ND

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
 J          Estimated value.  
 R          Unusable data.  
 VOCs      Volatile organic compounds.  
 ND        Not detected.

Table 10. Semivolatile Organic Compounds Detected in Surface Water, Royal Carting Services, East Fishkill, New York.

Sample Identification:	SW-1	SW-2	SW-3
Sample Date:	4/1/92	4/1/92	4/1/92
Parameter (concentrations in ug/L)			
Phenol	<10	<10	<10
bis(2-Chloroethyl)ether	<10	<10	<10
2-Chlorophenol	<10	<10	<10
1,3-Dichlorobenzene	<10	<10	<10
1,4-Dichlorobenzene	<10	<10	<10
Benzyl alcohol	<10	<10	<10
1,2-Dichlorobenzene	<10	<10	<10
2-Methylphenol	<10	<10	<10
bis(2-Chloroisopropyl)ether	<10	<10	<10
4-Methylphenol	<10	<10	<10
N-Nitroso-di-n-propylamine	<10	<10	<10
Hexachloroethane	<10	<10	<10
Nitrobenzene	<10	<10	<10
Isophorone	<10	<10	<10
2-Nitrophenol	<10	<10	<10
2,4-Dimethylphenol	<10	<10	<10
Benzoic acid	<50	<50	<50
bis(2-Chloroethoxy)methane	<10	<10	<10
2,4-Dichlorophenol	<10	<10	<10
1,2,4-Trichlorobenzene	<10	<10	<10
Naphthalene	<10	<10	<10
4-Chloroaniline	<10	<10	<10
Hexachlorobutadiene	<10	<10	<10
4-Chloro-3-methylphenol	<10	<10	<10
2-Methylnaphthalate	<10	<10	<10
Hexachlorocyclopentadiene	<10	<10	<10
2,4,6-Trichlorophenol	<10	<10	<10
2,4,5-Trichlorophenol	<50	<50	<50
2-Chloronaphthalene	<10	<10	<10
2-Nitroaniline	<50	<50	<50
Dimethylphthalate	<10	<10	<10
Acenaphthylene	<10	<10	<10
2,6-Dinitrotoluene	<10	<10	<10
3-Nitroaniline	<50	<50	<50
Acenaphthene	<10	<10	<10
2,4-Dinitrophenol	<50	<50	<50
4-Nitrophenol	<50	<50	<50
Dibenzofuran	<10	<10	<10
2,4-Dinitrotoluene	<10	<10	<10
Diethylphthalate	<10	<10	<10
4-Chlorophenyl-phenylether	<10	<10	<10
Fluorene	<10	<10	<10

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
J          Estimated value.

Table 10. Semivolatile Organic Compounds Detected in Surface Water, Royal Carting Services, East Fishkill, New York.

Parameter (concentrations in ug/L)	Sample Identification: Sample Date:	SW-1 4/1/92	SW-2 4/1/92	SW-3 4/1/92
4-Nitroaniline		<50	<50	<50
4,6-Dinitro-2-methylphenol		<50	<50	<50
N-Nitrosodiphenylamine		<10	<10	<10
4-Bromophenyl-phenylether		<10	<10	<10
Hexachlorobenzene		<10	<10	<10
Pentachlorophenol		<50	<50	<50
Phenanthrene		<10	<10	<10
Anthracene		<10	<10	<10
Di-n-butylphthalate		<10	<10	<10
Fluoranthene		<10	<10	<10
Pyrene		<10	<10	<10
Butylbenzylphthalate		<10	<10	<10
3,3'-Dichlorobenzidine		<20	<20	<20
Benzo(a)anthracene		<10	<10	<10
Chrysene		<10	<10	<10
bis(2-Ethylhexyl)phthalate		3 J	0.9 J	2 J
Di-n-octylphthalate		<10	<10	<10
Benzo(b)fluoranthene		<10	<10	<10
Benzo(k)fluoranthene		<10	<10	<10
Benzo(a)pyrene		<10	<10	<10
Indeno(1,2,3-cd)pyrene		<10	<10	<10
Dibenzo(a,h)anthracene		<10	<10	<10
Benzo(g,h,i)perylene		<10	<10	<10
Total SVOCs:		3	0.9	2

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
J          Estimated value.  
SVOCs    Semivolatile organic compounds.

Table 11. Pesticides/PCBs Detected in Surface Water, Royal Carting Services, East Fishkill, New York.

Sample Identification:	SW-1	SW-2	SW-3
Sample Date:	4/1/92	4/1/92	4/1/92
Parameter (concentrations in ug/L)			
<u>Pesticides:</u>			
alpha-BHC	<0.050	<0.050	<0.050
beta-BHC	<0.050	<0.050	<0.050
delta-BHC	<0.050	<0.050	<0.050
gamma-BHC (Lindane)	<0.050	<0.050	<0.050
Heptachlor	<0.050	<0.050	<0.050
Aldrin	<0.050	<0.050	<0.050
Heptachlor epoxide	<0.050	<0.050	<0.050
Endosulfan I	<0.050	<0.050	<0.050
Dieldrin	<0.10	<0.10	<0.10
4,4'-DDE	<0.10	<0.10	<0.10
Endrin	<0.10	<0.10	<0.10
Endosulfan II	<0.10	<0.10	<0.10
4,4'-DDD	<0.10	<0.10	<0.10
Endosulfan sulfate	<0.10	<0.10	<0.10
4,4'-DDT	<0.10	<0.10	<0.10
Methoxychlor	<0.50	<0.50	<0.50
Endrin ketone	<0.10	<0.10	<0.10
alpha-Chlordane	<0.50	<0.50	<0.50
gamma-Chlordane	<0.50	<0.50	<0.50
Toxaphene	<1.0	<1.0	<1.0
<u>PCBs:</u>			
Aroclor-1016	<0.50	<0.50	<0.50
Aroclor-1221	<0.50	<0.50	<0.50
Aroclor-1232	<0.50	<0.50	<0.50
Aroclor-1242	<0.50	<0.50	<0.50
Aroclor-1248	<0.50	<0.50	<0.50
Aroclor-1254	<1.0	<1.0	<1.0
Aroclor-1260	<1.0	<1.0	<1.0

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
PCBs      Polychlorinated biphenyls.

Table 12. Inorganics Detected in Surface Water, Royal Carting Services, East Fishkill, New York.

Parameter (concentrations in ug/L)	Sample Identification:		Sample Type:		Sample Date:	
	SW-1	SW-1	SW-2	SW-2	SW-3	SW-3
	Total	Dissolved	Total	Dissolved	Total	Dissolved
	4/1/92	4/1/92	4/1/92	4/1/92	4/1/92	4/1/92
Aluminum	2830	17.0 B	<67.5	<14.0	79.6 B	<14.0
Antimony	<21.0	<21.0	<21.0	<21.0	<21.0	<21.0
Arsenic	<2.0	<2.0	<2.0	<2.0	<2.0 J	<2.0
Barium	35.6 B	19.2 B	16.8 B	13.6 B	14.4 B	15.6 B
Beryllium	1.7 B	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Calcium	51400	48100	64000	65900	69000	69000
Chromium	5.3 B	<3.0	<3.0	<3.0	<3.0	<3.0
Cobalt	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Copper	<4.0	26.5	<4.0	41.8	<4.0	68.3
Iron	3750	242	309	82.2 B	<186	<42.0
Lead	10.9 J	9.8 B	1.5 BJ	<1.0	1.9 BJ	<4.8
Magnesium	9610	9990	9220	9480	9710	9670
Manganese	281	116	23.5	13.5 B	23.9	20.5
Mercury	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Nickel	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0
Potassium	<1960	<2600	<1170	<1140	<1190	<1500
Selenium	<2.0 J	<2.0 J	<2.0 J	<2.0 J	<2.0 J	<2.0 J
Silver	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Sodium	45200	36300	52000	54000	54000	54400
Thallium	<1.0 J	<1.0	<1.0	<1.0 J	<1.0	<1.0
Vanadium	6.2 B	<3.0	<3.0	<3.0	<3.0	<3.0
Zinc	35.7	15.2 B	<3.0	<3.0	<3.0	18.8 B
Cyanide	<10.0	-	<10.0	-	<10.0	-

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
 B        Concentration is between the instrument detection limit and the contract required detection limit.  
 J        Estimated value.  
 -        Not analyzed.

Table 13. Leachate Indicators Detected in Surface Water, Royal Carting Services, East Fishkill, New York.

Parameter (concentrations in mg/L)	Sample Identification: Sample Date:		
	SW-1 4/1/92	SW-2 4/1/92	SW-3 4/1/92
COD	<10.0	<10.0	<10.0
TDS	285	391	378
TSS	<5.00	<5.00	<5.00

Analyses performed by Industrial and Environmental Analysts, Inc.

mg/L      Milligrams per liter.  
 COD      Chemical oxygen demand.  
 TDS      Total dissolved solids.  
 TSS      Total suspended solids.

Table 14. Volatile Organic Compounds Detected in Stream Sediment, Royal Carting Services, East Fishkill, New York.

Sample Identification: Sample Date:	SS-1 4/1/92	SS-2 4/1/92	SS-3 4/1/92
Parameter (concentrations in ug/kg)			
Chloromethane	<31	<20	<15
Bromomethane	<31	<20	<15
Vinyl chloride	<31	<20	<15
Chloroethane	<31	<20	<15
Methylene chloride	<31	<12	<8
Acetone	<31	<20	37 J
Carbon disulfide	<16	<10	<8
1,1-Dichloroethene	<16	<10	<8
1,1-Dichloroethane	<16	<10	<8
1,2-Dichloroethene (total)	21	<10	<8
Chloroform	<16	<10	<8
1,2-Dichloroethane	<16	<10	<8
2-Butanone	<31	<20	<15
1,1,1-Trichloroethane	<16	<10	<8
Carbon tetrachloride	<16	<10	<8
Vinyl acetate	<31	<20	<15
Bromodichloromethane	<16	<10	<8
1,2-Dichloropropane	<16	<10	<8
cis-1,3-Dichloropropene	<16	<10	<8
Trichloroethene	40	<10	<8
Dibromochloromethane	<16	<10	<8
1,1,2-Trichloroethane	<16	<10	<8
Benzene	<16	<10	<8
trans-1,3-Dichloropropene	<16	<10	<8
Bromoform	<16	<10	<8
4-Methyl-2-pentanone	<31	<20	<15
2-Hexanone	<31	<20	<15
Tetrachloroethene	<80	<10	<8
1,1,2,2-Tetrachloroethene	<16	<10	<8
Toluene	<16	<10	<8
Chlorobenzene	<16	<10	<8
Ethylbenzene	<16	<10	<8
Styrene	<16	<10	<8
Xylene (total)	<16	<10	<8
Total VOCs:	61	ND	37

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/kg      Micrograms per kilogram.  
J          Estimated value.  
VOCs      Volatile organic compounds.  
ND        Not detected.

Table 14. Volatile Organic Compounds Detected in Stream Sediment, Royal Carting Services, East Fishkill, New York.

Sample Identification: Sample Date:	Field Blank 3 4/1/92	Trip Blank 4 4/1/92
Parameter (concentrations in ug/L)		
Chloromethane	<10	<10
Bromomethane	<10	<10
Vinyl chloride	<10	<10
Chloroethane	<10	<10
Methylene chloride	<10	<16
Acetone	<10	<10
Carbon disulfide	<5	<5
1,1-Dichloroethene	<5	<5
1,1-Dichloroethane	<5	<5
1,2-Dichloroethene (total)	1 J	<5
Chloroform	1 J	1 J
1,2-Dichloroethane	<5	<5
2-Butanone	<10	<10
1,1,1-Trichloroethane	2 J	<5
Carbon tetrachloride	<5	<5
Vinyl acetate	<10	<10
Bromodichloromethane	<5	<5
1,2-Dichloropropane	<5	<5
cis-1,3-Dichloropropene	<5	<5
Trichloroethene	<5	<5
Dibromochloromethane	<5	<5
1,1,2-Trichloroethane	<5	<5
Benzene	<5	<5
trans-1,3-Dichloropropene	<5	<5
Bromoform	<5	<5
4-Methyl-2-pentanone	<10	<10
2-Hexanone	<10	<10
Tetrachloroethene	0.5 J	<5
1,1,2,2-Tetrachloroethene	<5	<5
Toluene	<5	<5
Chlorobenzene	<5	<5
Ethylbenzene	<5	<5
Styrene	<5	<5
Xylene (total)	<5	<5
Total VOCs:	4.5	1

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
J          Estimated value.  
VOCs      Volatile organic compounds.

Table 15. Semivolatile Organic Compounds Detected in Stream Sediment, Royal Carting Services, East Fishkill, New York.

Sample Identification: Sample Date:	SS-1 4/1/92	SS-2 4/1/92	SS-3 4/1/92
Parameter (concentrations in ug/kg)			
Phenol	<1000	<700	<500
bis(2-Chloroethyl)ether	<1000	<700	<500
2-Chlorophenol	<1000	<700	<500
1,3-Dichlorobenzene	<1000	<700	<500
1,4-Dichlorobenzene	<1000	<700	<500
Benzyl alcohol	<1000	<700	<500
1,2-Dichlorobenzene	66 J	<700	<500
2-Methylphenol	<1000	<700	<500
bis(2-Chloroisopropyl)ether	<1000	<700	<500
4-Methylphenol	<1000	<700	<500
N-Nitroso-di-n-propylamine	<1000	<700	<500
Hexachloroethane	<1000	<700	<500
Nitrobenzene	<1000	<700	<500
Isophorone	<1000	<700	<500
2-Nitrophenol	<1000	<700	<500
2,4-Dimethylphenol	<1000	<700	<500
Benzoic acid	<4800	<3400	<2400
bis(2-Chloroethoxy)methane	<1000	<700	<500
2,4-Dichlorophenol	<1000	<700	<500
1,2,4-Trichlorobenzene	<1000	<700	<500
Naphthalene	<1000	<700	<500
4-Chloroaniline	<1000	<700	<500
Hexachlorobutadiene	<1000	<700	<500
4-Chloro-3-methylphenol	<1000	<700	<500
2-Methylnaphthalate	<1000	<700	<500
Hexachlorocyclopentadiene	<1000	<700	<500
2,4,6-Trichlorophenol	<1000	<700	<500
2,4,5-Trichlorophenol	<4800	<3400	<2400
2-Chloronaphthalene	<1000	<700	<500
2-Nitroaniline	<4800	<3400	<2400
Dimethylphthalate	<1000	<700	<500
Acenaphthylene	<1000	<700	<500
2,6-Dinitrotoluene	<1000	<700	<500
3-Nitroaniline	<4800	<3400	<2400
Acenaphthene	<1000	<700	<500
2,4-Dinitrophenol	<4800	<3400	<2400
4-Nitrophenol	<4800	<3400	<2400
Dibenzofuran	<1000	<700	<500
2,4-Dinitrotoluene	<1000	<700	<500
Diethylphthalate	<1000	<700	<500
4-Chlorophenyl-phenylether	<1000	<700	<500
Fluorene	<1000	<700	<500

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/kg      Micrograms per kilogram.  
J          Estimated value.

Table 15. Semivolatile Organic Compounds Detected in Stream Sediment, Royal Carting Services, East Fishkill, New York.

Sample Identification: Sample Date:	SS-1 4/1/92	SS-2 4/1/92	SS-3 4/1/92
Parameter (concentrations in ug/kg)			
4-Nitroaniline	<4800	<3400	<2400
4,6-Dinitro-2-methylphenol	<4800	<3400	<2400
N-Nitrosodiphenylamine	<1000	<700	<500
4-Bromophenyl-phenylether	<1000	<700	<500
Hexachlorobenzene	<1000	<700	<500
Pentachlorophenol	<4800	<3400	<2400
Phenanthrene	<1000	<700	<500
Anthracene	<1000	<700	<500
Di-n-butylphthalate	37 J	210 J	48 J
Fluoranthene	63 J	36 J	<500
Pyrene	67 J	34 J	<500
Butylbenzylphthalate	<1000	<700	<500
3,3'-Dichlorobenzidine	<2000	<1400	<1000
Benzo(a)anthracene	<1000	<700	<500
Chrysene	<1000	36 J	<500
bis(2-Ethylhexyl)phthalate	<1000	<700	<500
Di-n-octylphthalate	<1000	<700	<500
Benzo(b)fluoranthene	<1000	<700	<500
Benzo(k)fluoranthene	<1000	<700	<500
Benzo(a)pyrene	<1000	<700	<500
Indeno(1,2,3-cd)pyrene	<1000	<700	<500
Dibenzo(a,h)anthracene	<1000	<700	<500
Benzo(g,h,i)perylene	<1000	<700	<500
Total SVOCs:	233	316	48

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/kg      Micrograms per kilogram.

J          Estimated value.

SVOCs     Semivolatile organic compounds.

Table 16. Pesticides/PCBs Detected in Stream Sediment, Royal Carting Services, East Fishkill, New York.

Sample Identification:	SS-1	SS-2	SS-3
Sample Date:	4/1/92	4/1/92	4/1/92
Parameter (concentrations in ug/kg)			
<u>Pesticides:</u>			
alpha-BHC	<24	<17	<12
beta-BHC	<24	<17	<12
delta-BHC	<24	<17	<12
gamma-BHC (Lindane)	<24	<17	<12
Heptachlor	<24	<17	<12
Aldrin	<24	<17	<12
Heptachlor epoxide	<24	<17	<12
Endosulfan I	<24	<17	<12
Dieldrin	<48	<34	<24
4,4'-DDE	4.2 J	10 J	<24
Endrin	<48	<34	<24
Endosulfan II	<48	<34	<24
4,4'-DDD	<48	<34	<24
Endosulfan sulfate	<48	<34	<24
4,4'-DDT	<48	<34	<24
Methoxychlor	<240	<170	<120
Endrin ketone	<48	<34	<24
alpha-Chlordane	<240	<170	<120
gamma-Chlordane	<240	<170	<120
Toxaphene	<480	<340	<240
<u>PCBs:</u>			
Aroclor-1016	<240	<170	<120
Aroclor-1221	<240	<170	<120
Aroclor-1232	<240	<170	<120
Aroclor-1242	<240	<170	<120
Aroclor-1248	<240	<170	<120
Aroclor-1254	<480	<340	<240
Aroclor-1260	<480	<340	<240

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/kg      Micrograms per kilogram.  
J          Estimated value.

Table 17. Total Organic Carbon Detected in Stream Sediment, Royal Carting Services, East Fishkill, New York. -

Parameter (concentrations in mg/kg)	-Sample Identification:	SS-1	SS-2	SS-3
	Sample Date:	4/1/92	4/1/92	4/1/92
TOC		>80000 7	>80000	5310

Analyses performed by Industrial and Environmental Analysts, Inc.

mg/kg      Milligrams per kilogram.  
TOC        Total organic carbon.

Table 18. Inorganics Detected in Stream Sediment, Royal Carting Services, East Fishkill, New York.

Sample Identification:	SS-1	SS-2	SS-3
Sample Date:	4/1/92	4/1/92	4/1/92
Parameter (concentrations in mg/kg)			
Aluminum	39800	16400	18400
Antimony	<17.8 J	<6.5 J	<5.7 J
Arsenic	4.1 B	1.1 B	6.3
Barium	330	89.0	70.9
Beryllium	2.4 B	1.0 B	<0.27
Cadmium	<1.7	<0.62	<0.55
Calcium	12900	2450	2770
Chromium	45.6	16.7	22.1
Cobalt	17.0 B	9.0 B	15.8
Copper	36.2	14.6	33.7
Iron	37600	30800	36400
Lead	90.2 J	31.6 J	22.3 J
Magnesium	8680	4790	7320
Manganese	906	316	784
Mercury	<0.42 J	<0.14 J	<0.11 J
Nickel	37.2	19.0	30.0
Potassium	<2480	<1100	1590
Selenium	2.1 BJ	<0.53 J	<0.60 J
Silver	<1.7	<0.62	<0.55
Sodium	454 B	147 B	86.7 B
Thallium	<0.80	<0.26	<0.30
Vanadium	49.5	21.0	20.7
Zinc	157 J	119 J	92.8 J
Cyanide	<10.3	<3.5	<3.9

Analyses performed by Industrial and Environmental Analysts, Inc.

mg/kg Milligrams per kilogram.

B Concentration is between the instrument detection limit and the contract required detection limit.

J Estimated value.

Table 19. Volatile Organic Compounds Detected in Ground Water, Royal Carting Services, East Fishkill, New York.

Sample Identification: Sample Date:	—Replicates—				
	W-1 4/2/92	W-2 4/2/92	W-2 4/2/92	W-3 4/2/92	W-4 4/2/92
Parameter (concentrations in ug/L)					
Dichlorodifluoromethane	<1.0	180 J	220 J	0.10 J	<1.0
Chloromethane	<1.0	<20	<20	<1.0	<1.0
Vinyl chloride	<1.0	<20	<20	<1.0	<1.0
Bromomethane	<1.0	26 J	<20	<1.0	<1.0
Chloroethane	<1.0	<20	<20	<1.0	<1.0
Trichlorofluoromethane	<1.0	<20	<20	<1.0 J	0.70 J
Methylene chloride	<1.0	<20	<20	<1.0	<1.0
1,1-Dichloroethene	<1.0	<20	<20	<1.0	<1.0
trans-1,2-Dichloroethene	<1.0	<20	<20	<1.0	<1.0
1,1-Dichloroethane	<1.0	<20	<20	0.10 J	<1.0
2,2-Dichloropropane	<1.0	<20 J	<20 J	<1.0 J	<1.0
cis-1,2-Dichloroethene	<1.0	<20	<20	<1.0	<1.0
Bromochloromethane	<1.0	<20	<20	<1.0	<1.0
Chloroform	<1.0	<20	<20	<1.0	<1.0
1,1,1-Trichloroethane	<1.0	<20	<20	<1.0	<1.0
1,1-Dichloropropene	<1.0	<20	<20	<1.0	<1.0
Carbon tetrachloride	<1.0	<20	<20	<1.0	<1.0
Benzene	<1.0	<20	<20	<1.0	<1.0
1,2-Dichloroethane	<1.0	<20	<20	<1.0	<1.0
Trichloroethene	<1.0	<20	1.6 J	<1.0	0.10 J
1,2-Dichloropropane	<1.0	<20	<20	<1.0	<1.0
Dibromomethane	<1.0	<20	<20	<1.0	<1.0
Bromodichloromethane	<1.0	<20	<20	<1.0	<1.0
cis-1,3-Dichloropropene	<1.0	<20	<20	<1.0	<1.0
Toluene	0.07 J	<20	<20	<1.0	<1.0
trans-1,3-Dichloropropene	R	<20	<20	<1.0	R
1,1,2-Trichloroethane	<1.0	<20	<20	<1.0	<1.0
Tetrachloroethene	<1.0	<20	2.3 J	<1.0	<1.0
1,3-Dichloropropane	<1.0	<20	<20	<1.0	<1.0
Dibromochloromethane	<1.0	<20	<20	<1.0	<1.0
1,2-Dibromomethane	<1.0	<20	<20	<1.0	<1.0
Chlorobenzene	<1.0	<20	<20	<1.0	<1.0
1,1,1,2-Tetrachloroethane	<1.0	<20	<20	<1.0	<1.0
Ethylbenzene	<1.0	<20	<20	<1.0	0.04 J
meta and/or para-Xylene	0.06 J	<20	<20	<1.0	0.05 J
ortho-Xylene	<1.0	<20	<20	<1.0	<1.0
Styrene	<1.0	<20	<20	<1.0	<1.0
Bromoform	R	R	R	R	R
Isopropylbenzene	<1.0	<20	<20	<1.0	<1.0
Bromobenzene	<1.0	<20	<20	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<20	<20	<1.0	<1.0
1,2,3-Trichloropropane	<1.0	<20	<20	<1.0	<1.0
Propylbenzene	<1.0	<20	<20	<1.0	0.03 J

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
 J          Estimated value.  
 R          Unusable data.

Table 19. Volatile Organic Compounds Detected in Ground Water, Royal Carting Services, East Fishkill, New York.

Sample Identification: Sample Date:	Replicates		W-3 4/2/92	W-4 4/2/92
	W-1 4/2/92	W-2 4/2/92		
Parameter (concentrations in ug/L)				
2-Chlorotoluene	<1.0	<20	<1.0	<1.0
4-Chlorotoluene	<1.0	<20	<1.0	<1.0
1,3,5-Trimethylbenzene	<1.0	<20	<1.0	<1.0
tert-Butylbenzene	<1.0	<20	<1.0	<1.0
1,2,4-Trimethylbenzene	0.08 J	<20	<1.0	0.07 J
sec-Butylbenzene	<1.0	<20	<1.0	<1.0
1,3-Dichlorobenzene	<1.0	<20	<1.0	<1.0
p-Isopropyltoluene	0.04 J	<20	<1.0	0.04 J
1,4-Dichlorobenzene	<1.0	<20	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<20	<1.0	<1.0
Butylbenzene	<1.0	<20	<1.0	<1.0
1,2-Dibromo-3-chloropropane	<1.0	<20	<1.0	<1.0
1,2,4-Trichlorobenzene	<1.0	<20	<1.0	<1.0
Hexachlorobutadiene	<1.0	<20	<1.0	<1.0
Naphthalene	<1.0	<20	<1.0	<1.0
1,2,3-Trichlorobenzene	<1.0	<20	<1.0	<1.0
Total VOCs:	0.25	206	0.2	1.03

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
 J        Estimated value.  
 R        Unusable data.  
 VOCs    Volatile organic compounds.

Table 19. Volatile Organic Compounds Detected in Ground Water, Royal Carting Services, East Fishkill, New York.

Sample Identification: Sample Date:	Field Blank 2 4/2/92	Trip Blank 3 4/2/92
Parameter (concentrations in ug/L)		
Dichlorodifluoromethane	0.10 J	0.20 J
Chloromethane	<1.0	<1.0
Vinyl chloride	<1.0	<1.0
Bromomethane	<1.0	<1.0
Chloroethane	<1.0	<1.0
Trichlorofluoromethane	<1.0	<1.0
Methylene chloride	<1.0	<1.0
1,1-Dichloroethene	<1.0	<1.0
trans-1,2-Dichloroethene	<1.0	<1.0
1,1-Dichloroethane	<1.0	<1.0
2,2-Dichloropropane	<1.0 J	<1.0 J
cis-1,2-Dichloroethene	<1.0	<1.0
Bromochloromethane	<1.0	<1.0
Chloroform	<1.0	0.20 J
1,1,1-Trichloroethane	0.09 J	0.10 J
1,1-Dichloropropene	<1.0	<1.0
Carbon tetrachloride	<1.0	<1.0
Benzene	0.04 J	<1.0
1,2-Dichloroethane	<1.0	<1.0
Trichloroethene	<1.0	<1.0
1,2-Dichloropropane	<1.0	<1.0
Dibromomethane	<1.0	<1.0
Bromodichloromethane	<1.0	<1.0
cis-1,3-Dichloropropene	<1.0	<1.0
Toluene	<1.0	<1.0
trans-1,3-Dichloropropene	<1.0	<1.0
1,1,2-Trichloroethane	<1.0	<1.0
Tetrachloroethene	<1.0	<1.0
1,3-Dichloropropane	<1.0	<1.0
Dibromochloromethane	<1.0	<1.0
1,2-Dibromomethane	<1.0	<1.0
Chlorobenzene	0.06 J	<1.0
1,1,1,2-Tetrachloroethane	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
meta and/or para-Xylene	<1.0	<1.0
ortho-Xylene	<1.0	<1.0
Styrene	<1.0	0.06 J
Bromoform	R	R
Isopropylbenzene	<1.0	<1.0
Bromobenzene	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0
1,2,3-Trichloropropane	<1.0	<1.0
Propylbenzene	<1.0	<1.0

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
 J         Estimated value.  
 R         Unusable data.

Table 19. Volatile Organic Compounds Detected in Ground Water, Royal Carting Services, East Fishkill, New York.

Sample Identification: Sample Date:	Field Blank 2 4/2/92	Trip Blank 3 4/2/92
Parameter (concentrations in ug/L)		
2-Chlorotoluene	<1.0	<1.0
4-Chlorotoluene	<1.0	<1.0
1,3,5-Trimethylbenzene	<1.0	<1.0
tert-Butylbenzene	<1.0	<1.0
1,2,4-Trimethylbenzene	<1.0	<1.0
sec-Butylbenzene	<1.0	<1.0
1,3-Dichlorobenzene	<1.0	<1.0
p-Isopropyltoluene	<1.0	<1.0
1,4-Dichlorobenzene	<1.0	<1.0
1,2-Dichlorobenzene	<1.0	<1.0
Butylbenzene	<1.0	<1.0
1,2-Dibromo-3-chloropropane	<1.0	<1.0
1,2,4-Trichlorobenzene	<1.0	<1.0
Hexachlorobutadiene	<1.0	<1.0
Naphthalene	<1.0	<1.0
1,2,3-Trichlorobenzene	<1.0	<1.0
Total VOCs:	0.29	0.56

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
J          Estimated value:  
R          Unusable data.  
VOCs      Volatile organic compounds.

Table 20. Semivolatile Organic Compounds Detected in Ground Water, Royal Carting Services, East Fishkill, New York.

Parameter (concentrations in ug/L)	Sample Identification: Sample Date:	---Replicates---			
		W-1 4/2/92	W-2 4/2/92	W-2 4/2/92	W-3 4/2/92
Phenol		<10	<10	<10	<10
bis(2-Chloroethyl)ether		<10	<10 J	<10	<10
2-Chlorophenol		<10	<10	<10	<10
1,3-Dichlorobenzene		<10	<10 J	<10	<10
1,4-Dichlorobenzene		<10	<10 J	<10	<10
Benzyl alcohol		<10	<10	<10	<10
1,2-Dichlorobenzene		<10	<10 J	<10	<10
2-Methylphenol		<10	<10	<10	<10
bis(2-Chloroisopropyl)ether		<10	<10 J	<10	<10
4-Methylphenol		<10	<10	<10	<10
N-Nitroso-di-n-propylamine		<10	<10 J	<10	<10
Hexachloroethane		<10	<10 J	<10	<10
Nitrobenzene		<10	<10 J	<10	<10
Isophorone		<10	<10 J	<10	<10
2-Nitrophenol		<10	<10	<10	<10
2,4-Dimethylphenol		<10	<10	<10	<10
Benzoic acid		<50.0	<50.0	<50.0	<50.0
bis(2-Chloroethoxy)methane		<10	<10 J	<10	<10
2,4-Dichlorophenol		<10	<10 J	<10	<10
1,2,4-Trichlorobenzene		<10	<10 J	<10	<10
Naphthalene		<10	<10 J	<10	<10
4-Chloroaniline		<10	<10 J	<10	<10
Hexachlorobutadiene		<10	<10 J	<10	<10
4-Chloro-3-methylphenol		<10	<10	<10	<10
2-Methylnaphthalate		<10	<10 J	<10	<10
Hexachlorocyclopentadiene		<10	<10 J	<10	<10
2,4,6-Trichlorophenol		<10	<10	<10	<10
2,4,5-Trichlorophenol		<50	<50	<50	<50
2-Chloronaphthalene		<10	<10 J	<10	<10
2-Nitroaniline		<50	<50 J	<50	<50
Dimethylphthalate		<10	<10 J	<10	<10
Acenaphthylene		<10	<10 J	<10	<10
2,6-Dinitrotoluene		<10	<10 J	<10	<10
3-Nitroaniline		<50	<50 J	<50	<50
Acenaphthene		<10	<10 J	<10	<10
2,4-Dinitrophenol		<50	<50	<50	<50
4-Nitrophenol		<50	<50	<50	<50
Dibenzofuran		<10	<10 J	<10	<10
2,4-Dinitrotoluene		<10	<10 J	<10	<10
Diethylphthalate		<10	<10 J	<10	<10
4-Chlorophenyl-phenylether		<10	<10 J	<10	<10
Fluorene		<10	<10 J	<10	<10

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
J          Estimated value.

Table 20. Semivolatile Organic Compounds Detected in Ground Water, Royal Carting Services, East Fishkill, New York.

Parameter (concentrations in ug/L)	Sample Identification: Sample Date:	W-1 4/2/92	—Replicates—		W-3 4/2/92	W-4 4/2/92
			W-2 4/2/92	W-2 4/2/92		
4-Nitroaniline		<50	<50 J	<50	<50	<50
4,6-Dinitro-2-methylphenol		<50	<50	<50	<50	<50
N-Nitrosodiphenylamine		<10	<10 J	<10	<10	<10
4-Bromophenyl-phenylether		<10	<10 J	<10	<10	<10
Hexachlorobenzene		<10	<10 J	<10	<10	<10
Pentachlorophenol		<50	<50	<50	<50	<50
Phenanthrene		<10	<10 J	<10	<10	<10
Anthracene		<10	<10 J	<10	<10	<10
Di-n-butylphthalate		<10	<10 J	<10	<10	<10
Fluoranthene		<10	<10 J	<10	<10	<10
Pyrene		<10	<10 J	<10	<10	<10
Butylbenzylphthalate		<10	<10 J	<10	<10	<10
3,3'-Dichlorobenzidine		<20	<20 J	<20	<20	<20
Benzo(a)anthracene		<10	<10 J	<10	<10	<10
Chrysene		<10	<10 J	<10	<10	<10
bis(2-Ethylhexyl)phthalate		5 J	4 J	2 J	0.8 J	4 J
Di-n-octylphthalate		<10	<10 J	<10	<10	1 J
Benzo(b)fluoranthene		<10	<10 J	<10	<10	<10
Benzo(k)fluoranthene		<10	<10 J	<10	<10	<10
Benzo(a)pyrene		<10	<10 J	<10	<10	<10
Indeno(1,2,3-cd)pyrene		<10	<10 J	<10	<10	<10
Dibenzo(a,h)anthracene		<10	<10 J	<10	<10	<10
Benzo(g,h,i)perylene		<10	<10 J	<10	<10	<10
Total SVOCs:		5	4	2	0.8	5

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
 J          Estimated value.  
 SVOCs    Semivolatile organic compounds.

Table 21. Pesticides/PCBs Detected in Ground Water, Royal Carting Services, East Fishkill, New York.

Sample Identification: Sample Date:	Replicates				W-4 4/2/92
	W-1 4/2/92	W-2 4/2/92	W-2 4/2/92	W-3 4/2/92	
Parameter (concentrations in ug/L)					
<u>Pesticides:</u>					
alpha-BHC	<0.050	<0.050	<0.050	<0.050	<0.050
beta-BHC	<0.050	<0.050	<0.050	<0.050	<0.050
delta-BHC	<0.050	<0.050	<0.050	<0.050	<0.050
gamma-BHC (Lindane)	<0.050	<0.050	<0.050	<0.050	<0.050
Heptachlor	<0.050	<0.050	<0.050	<0.050	<0.050
Aldrin	<0.050	<0.050	<0.050	<0.050	<0.050
Heptachlor epoxide	<0.050	<0.050	<0.050	<0.050	<0.050
Endosulfan I	<0.050	<0.050	<0.050	<0.050	<0.050
Dieldrin	<0.10	<0.10	<0.10	<0.10	<0.10
4,4'-DDE	<0.10	<0.10	<0.10	<0.10	<0.10
Endrin	<0.10	<0.10	<0.10	<0.10	<0.10
Endosulfan II	<0.10	<0.10	<0.10	<0.10	<0.10
4,4'-DDD	<0.10	<0.10	<0.10	<0.10	<0.10
Endosulfan sulfate	<0.10	<0.10	<0.10	<0.10	<0.10
4,4'-DDT	<0.10	<0.10	<0.10	<0.10	<0.10
Methoxychlor	<0.50	<0.50	<0.50	<0.50	<0.50
Endrin ketone	<0.10	<0.10	<0.10	<0.10	<0.10
alpha-Chlordane	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-Chlordane	<0.50	<0.50	<0.50	<0.50	<0.50
Toxaphene	<1.0	<1.0	<1.0	<1.0	<1.0
<u>PCBs:</u>					
Aroclor-1016	<0.50	<0.50	<0.50	<0.50	<0.50
Aroclor-1221	<0.50	<0.50	<0.50	<0.50	<0.50
Aroclor-1232	<0.50	<0.50	<0.50	<0.50	<0.50
Aroclor-1242	<0.50	<0.50	<0.50	<0.50	<0.50
Aroclor-1248	<0.50	<0.50	<0.50	<0.50	<0.50
Aroclor-1254	<1.0	<1.0	<1.0	<1.0	<1.0
Aroclor-1260	<1.0	<1.0	<1.0	<1.0	<1.0

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L Micrograms per liter.  
PCBs Polychlorinated biphenyls.

Table 22. Inorganics Detected in Ground Water, Royal Carting Services, East Fishkill, New York.

Parameter (concentrations in ug/L)	Sample Identification:		—Replicates—		—Replicates—	
	W-1	W-1	W-2	W-2	W-2	W-2
	Total	Dissolved	Total	Total	Dissolved	Dissolved
	Sample Date:	Sample Date:	Sample Date:	Sample Date:	Sample Date:	Sample Date:
	4/2/92	4/2/92	4/2/92	4/2/92	4/2/92	4/2/92
Aluminum	637	16.2 B	2760	2570	<24.8	<19.1
Antimony	<21.0	<21.0	<21.0	<21.0	<21.0	<21.0
Arsenic	<2.0	<2.0	2.4 B	2.2 B	2.0 B	3.1 B
Barium	19.6 B	16.8 B	36.8 B	36.4 B	32.8 B	45.2 B
Beryllium	<1.0	<1.0	1.7 B	1.8 B	1.7 B	1.6 B
Cadmium	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Calcium	64800	71800	76700	77900	81100	77800
Chromium	<3.0	<3.0	5.5 B	<3.0	<3.0	<3.0
Cobalt	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Copper	<4.0	10.5 B	<4.0	<4.0	<4.0	<4.0
Iron	1380	<42.0	8650	7870	3790	3050
Lead	2.2 B	1.1 BJ	6.5	4.8 B	1.9 BJ	<1.0
Magnesium	16200	17700	13100	13100	12900	12300
Manganese	78.4	5.7 B	924	1030	950	1360
Mercury	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Nickel	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0
Potassium	<1390	<861	<3090	<2770	<2520	<1690
Selenium	<2.0	<2.0	<2.0	<2.0 J	<2.0 J	<2.0 J
Silver	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Sodium	165000	188000	35000	35800	38000	38300
Thallium	<1.0	<1.0 J	1.4 B	<1.0 J	<1.0 J	<1.0
Vanadium	<3.0	<3.0	9.5 B	9.0 B	<3.0	<3.0
Zinc	5.8 B	<3.0	25.4	21.4	18.8 B	23.3
Cyanide	<10.0	—	<10.0	<10.0	—	—

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L Micrograms per liter.  
 B Concentration is between the instrument detection limit and the contract required detection limit.  
 J Estimated value.  
 — Not analyzed.

Table 22. Inorganics Detected in Ground Water, Royal Carting Services, East Fishkill, New York.

Parameter (concentrations in ug/L)	Sample Identification:		Sample Type:		Sample Date:	
	W-3		W-3		W-4	
	Total		Dissolved		Total	
	4/2/92		4/2/92		4/2/92	
Aluminum	587		<19.0		690	
Antimony	<21.0		<21.0		<21.0	
Arsenic	<2.0		<2.0 J		<2.0	
Barium	14.8 B		12.8 B		<26.6	
Beryllium	1.6 B		<1.0		<1.0	
Cadmium	<2.0		<2.0		<2.0	
Calcium	82600		95100		26900	
Chromium	<3.0		<3.0		<3.0	
Cobalt	<3.0		<3.0		<3.0	
Copper	<4.0		6.0 B		4.2 B	
Iron	1360		<42.0		2060	
Lead	<2.5 J		<1.0		2.8 BJ	
Magnesium	14300		16600		9650	
Manganese	520		444		556	
Mercury	<0.20		<0.20		<0.20	
Nickel	<7.0		<7.0		7.7 B	
Potassium	<1630		<1770		14900	
Selenium	<2.0 J		<2.0 J		<2.0	
Silver	<2.0		<2.0		<2.0	
Sodium	37000		39100		42000	
Thallium	<1.6		<1.0 J		<1.0	
Vanadium	<3.0		<3.0		3.1 B	
Zinc	8.2 B		<3.0		<9.5	
Cyanide	<10.0		-		<10.0	

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/L      Micrograms per liter.  
 B        Concentration is between the instrument detection limit and the contract required detection limit.  
 J        Estimated value.  
 -        Not analyzed.

Table 23. Leachate Indicators Detected in Ground Water, Royal Carting Services, East Fishkill, New York.

Parameter (concentrations in mg/L)	Sample Identification:	—Replicates—			
	Sample Date:	W-1	W-2	W-3	W-4
	4/2/92	4/2/92	4/2/92	4/2/92	4/2/92
COD		<10.0	20.7	18.5	<10.0
TDS		679	414	438	509
TSS		63.0	212	353	111

Analyses performed by Industrial and Environmental Analysts, Inc.

mg/L      Milligrams per liter.  
 COD      Chemical oxygen demand.  
 TDS      Total dissolved solids.  
 TSS      Total suspended solids.

Table 24. Analytical Results for Contents of Metal Container, Royal Carting Services, East Fishkill, New York.

Parameter	Metal	
	Sample Identification:	Container
	Sample Date:	3/25/92
(concentrations in ug/kg unless otherwise indicated)		
<u>Semivolatile Organic Compounds:</u>		
bis(2-Chloroethyl)ether		<200000
1,3-Dichlorobenzene		9600 J
1,4-Dichlorobenzene		48000 J
1,2-Dichlorobenzene		390000
bis(2-Chloroisopropyl)ether		<200000
N-Nitroso-di-n-propylamine		<200000
Hexachloroethane		<200000
Nitrobenzene		<200000
Isophorone		<200000
2,4-Dimethylphenol		<200000
bis(2-Chloroethoxy)methane		<200000
1,2,4-Trichlorobenzene		<200000
Naphthalene		35000 J
4-Chloroaniline		12000 J
Hexachlorobutadiene		<200000
2-Methylnaphthalate		20000 J
Hexachlorocyclopentadiene		<200000
2-Chloronaphthalene		<200000
2-Nitroaniline		<960000
Dimethylphthalate		<200000
Acenaphthylene		<200000
2,6-Dinitrotoluene		<200000
3-Nitroaniline		<960000
Acenaphthene		<200000
Dibenzofuran		<200000
2,4-Dinitrotoluene		<200000
Diethylphthalate		<200000
4-Chlorophenyl-phenylether		<200000
Fluorene		<200000
4-Nitroaniline		<960000
N-Nitrosodiphenylamine		890000
4-Bromophenyl-phenylether		<200000
Hexachlorobenzene		<200000
Phenanthrene		18000 J
Anthracene		<200000
Di-n-butylphthalate		<200000
Fluoranthene		<200000
Pyrene		<200000
Butylbenzylphthalate		<200000
3,3'-Dichlorobenzidine		<400000
Benzo(a)anthracene		<200000

Analyses performed by Industrial and Environmental Analysts, Inc.

ug/kg    Micrograms per kilogram.  
 mg/kg    Milligrams per kilogram.  
 J        Estimated value.  
 PCBs    Polychlorinated biphenyls.  
 HC-IR    Petroleum hydrocarbons by infrared spectroscopy.

Table 24. Analytical Results for Contents of Metal Container, Royal Carting Services, East Fishkill, New York.

Parameter	Sample Identification:	Metal
	Sample Date:	Container
(concentrations in ug/kg unless otherwise indicated)		
<u>Semivolatile Organic Compounds (Cont.):</u>		
Chrysene		<200000
bis(2-Ethylhexyl)phthalate		<5700
Di-n-octylphthalate		3400 J
Benzo(b)fluoranthene		<200000
Benzo(k)fluoranthene		<200000
Benzo(a)pyrene		<200000
Indeno(1,2,3-cd)pyrene		<200000
Dibenzo(a,h)anthracene		<200000
Benzo(g,h,i)perylene		<200000
Total SVOCs:		1426000

PCBs:

Aroclor-1016	<1500
Aroclor-1221	<1500
Aroclor-1232	<1500
Aroclor-1242	<1500
Aroclor-1248	<1500
Aroclor-1254	<3000
Aroclor-1260	<3000

Petroleum Hydrocarbons:

HC-IR (mg/kg)	428000
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Analyses performed by Industrial and Environmental Analysts, Inc.

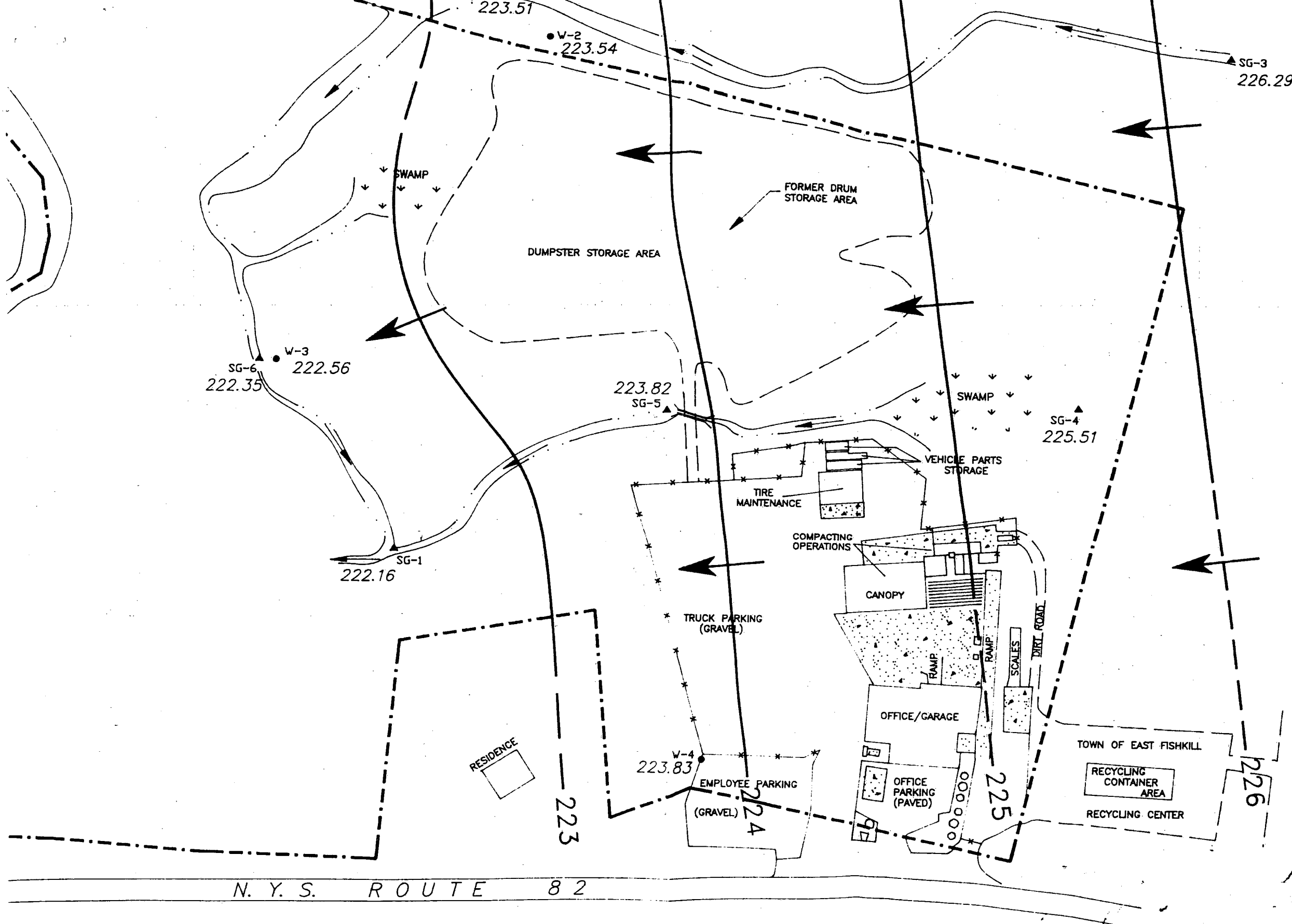
ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
J	Estimated value.
PCBs	Polychlorinated biphenyls.
HC-IR	Petroleum hydrocarbons by infrared spectroscopy.

Table 25. Comparison of Hydraulic Conductivity Data from the Sieve Analyses and Slug Tests, Royal Carting Services, East Fishkill, New York.

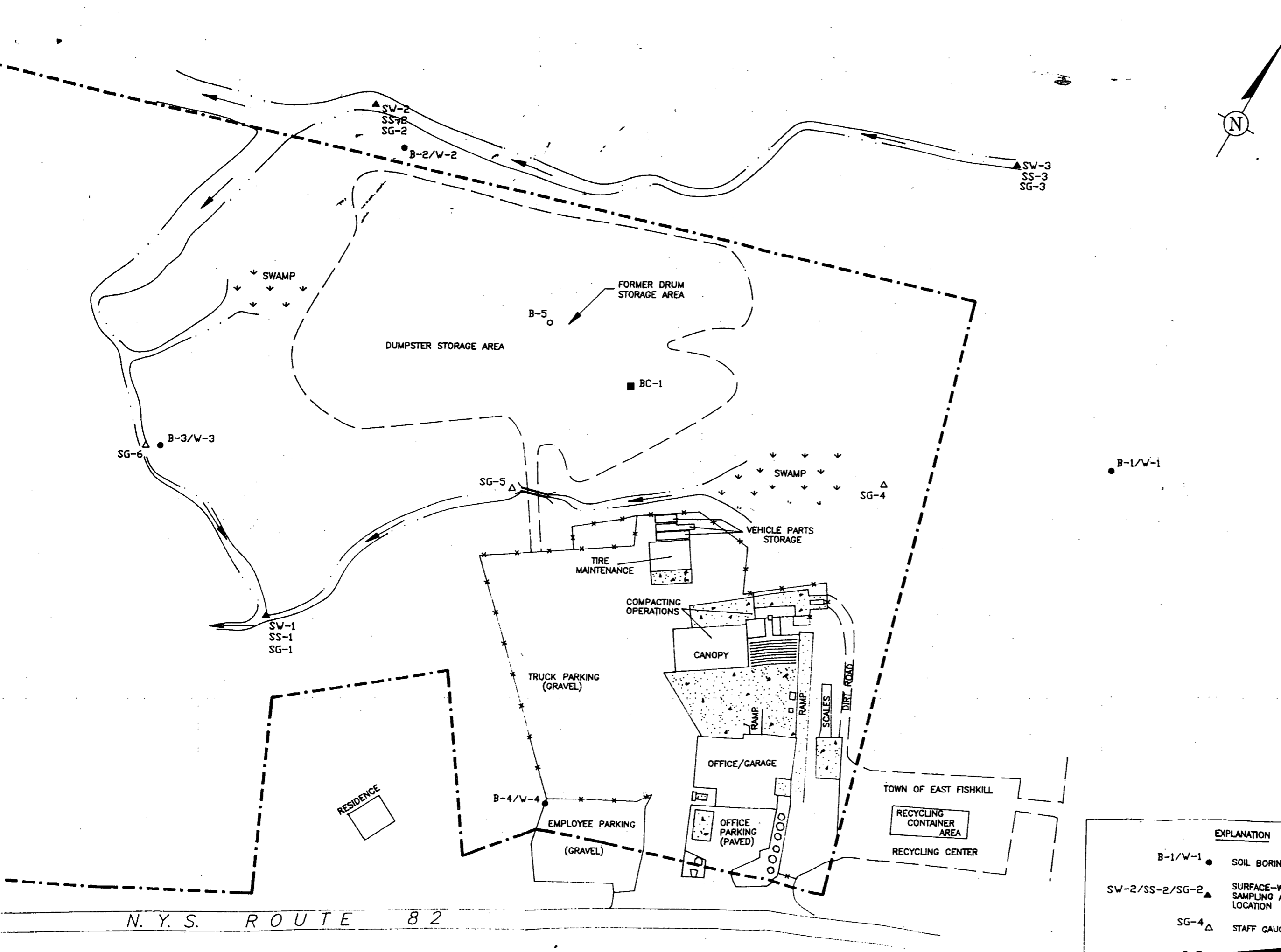
Well	Sieve Analysis	Slug Test
	(ft/day)	(ft/day)
W-1	<15.4	6.16
W-2	16.5	38.9
W-3	16.5	70.1
W-4	<15.4	51.9
Average:	15.9	41.8

ft/day Feet per day.

FIGURES



EXPLANATION	
W-1 ●	WELL LOCATION
SG-2 ▲	STAFF GAUGE LOCATION
226.29	WATER-LEVEL ELEVATION IN FEET ABOVE MEAN SEA LEVEL
— 226	LINE OF EQUAL WATER-TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL, DASHED WHERE INFERRED
←	GROUND-WATER FLOW DIRECTION
→	SPROUT CREEK FLOW DIRECTION
—	SEASONAL DRAINAGE COURSE AND FLOW DIRECTION
— * —	FENCE
---	PROPERTY BOUNDARY



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EXPLANATION

- B-1/W-1 ● SOIL BORING/WELL LOCATION
- SW-2/SS-2/SG-2 ▲ SURFACE-WATER/STREAM SEDIMENT SAMPLING AND STAFF GAUGE LOCATION
- SG-4 △ STAFF GAUGE LOCATION